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JPRS Report

Environmental Issues

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Environmental Issues

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Soviet Urges More Stringent Environmental Oversight of Maritime Fishing Zones

90WN0174B Moscow RYBNOYE KHOZYAYSTVO in Russian No 6, Jun 90 pp 40-45

[Article by N.A. Yastrebova under the rubric "Marine Biological Resources—Fish Protection: Facts, Problems": "It is Becoming More Difficult to Work"]

[Text] The departmental approach to the use of water resources has resulted in destruction of the habitat of many kinds of fish and other marine organisms. Hydroelectric power plants have blocked the way to spawning grounds, water is being removed for irrigation, large and small rivers, lakes and seas are being polluted with industrial and agricultural waste and oil. The bioproductivity of internal and external bodies of water is dropping due to economic development.

In the complex situation of hydraulic engineering construction and the development of industry and agriculture, Glavrybprom [Main Administration of the Fishing Industry] is expected to resolve a large number of problems pertaining to the protection and reproduction of fish stocks, the regulation of fishing in inland seas, territorial waters, the economic zone and the continental shelf of the USSR, and establishing a stable supply of raw materials for the fishing industry. Glavrybprom includes 43 basin administrations and a branched network of fish protection inspectorates (700), fish breeding enterprises (82), production acclimatization stations (9), fish monitoring stations and sites (300), expeditions (9) and other subdivisions.

During the past 2 years the fish protection agencies have had to work under extremely difficult conditions, in a situation of instability and uncertainty. Nonetheless, the work performed to protect and reproduce fish stocks even in the extremely unsatisfactory ecological conditions is making it possible to maintain the fish stocks and assure a stable catch in inland bodies of water and in the economic zone of the USSR.

There are numerous problem areas in the work of fish protection agencies. No real progress has been made toward providing them with the modern specialized vessels they need so much for monitoring fishing in the economic zone of the USSR. Problems have arisen in connection with the matter of granting the State Committee for Environmental Protection and its agencies authority to control fishing and protect fish stocks, and of granting authority to regulate fishing to soviet organs of a number of republics and oblasts, making it more difficult to regulate fishing and weakening the protection of fish stocks. Malicious poaching has increased. The fishing inspectors lack social, physical and legal protection. The wage system has not yet been rectified for workers with the fish protection agencies. There is a shortage of supplies and transport. This is far from a complete list of the issues being discussed in the Board of the USSR Ministry of the Fish Industry.

We are reporting for our readers the results of the work performed by Glavrybvod in 1989 to protect live resources in the economic zone and on the continental shelf of the USSR and to protect and reproduce fish stocks in our nation's inland bodies of water, and informing them of the problems which are hampering the fish protection agencies in their work.

The economic (fishing) zone and the continental shelf of the USSR contain huge biological stocks. Suffice it to say that the industry harvests more than 5 million tons of valuable fish species and other marine products in these waters annually.

A fishing quota is granted to foreign states in the 200-mile zone of the USSR (the USSR has quotas in fishing zones under the jurisdiction of foreign states). Nine nations fished within the USSR's zone in 1989 under reciprocal agreements: Japan, the DPROK, China, Norway, the Faeroe Islands, Bulgaria, the GDR, Sweden and Finland. Their total catch in 1989 amounted to 646,200 tons, and the number of fishing vessels permitted to fish there totaled 2,149 (6 years ago the figures were 1.5 million tons and 5,370 vessels).

Border patrol ships, marine fish protection vessels and aircraft of the border troops and the Ministry of Civil Aviation with special fish protection inspectors and interpreters aboard patrol Soviet and foreign fishing grounds and areas where fishing is prohibited to assure that fishing is conducted in a prudent manner and that a stable raw materials supply is maintained. Meteorological, ice and fish reconnaissance aircraft are used concomitantly.

A total of 7,309 fishing vessels were inspected and 758 violations of fishing rules were revealed during 10 months of 1989. The violators were fined 121,600 rubles, and 6,400 tons of fish worth 995,400 rubles was confiscated. Inspectors made 2,285 on-board inspections of foreign fishing vessels, 193 violations were discovered, and the fines levied against the violators plus the amount of the declared loss totalled more than 2.1 million convertible rubles.

The combined catch of all foreign vessels was 182,000 tons, against a quota of 646,200 tons (28.2%). Japanese, Korean and Chinese vessels caught 171,200 tons of fish in our zone in the Far East, against a quota of 530,000 tons (32.3%). Fish protection agencies conducted 2,145 inspections of Japanese, Korean and Chinese vessels in the region and revealed 175, 10 and 7 violations respectively. The total amount of the fines and compensation amounted to 2,119,000 convertible rubles. The foreign fleet caught 8,700 tons in the Barents Sea, against a combined quota of 98,500 tons. The Norwegians caught 9,130 seals, with a quota of 9,500. A total of 118 foreign vessels were inspected in the economic zone of the USSR in that sea, and no violations were found. The foreign fleet caught 10,000 tons in the economic zone of the USSR in the Baltic Sea, against a quota of 17,700 tons.

Inspectors inspected 22 foreign vessels. One violation was detected, involving a Swedish ship, and the captain was issued a warning.

Japanese fishermen were the main violators, as in past years, committing 90% of all the violations.

In areas of the Northern Kurils and Southwest Kamchatka fish protection agencies detected cases of large-scale poaching by Japanese vessels carrying phony numbers and names. Glavrybvod suspended fishing for all Japanese vessels committing violations. Appropriate notice was issued to the General Consulate in Nakhodka, and a note was delivered to the Japanese Embassy in Moscow through the Ministry of Foreign Affairs. Those committing the violations were fined a total of 1.4 million convertible rubles, and Japanese authorities confined the violating vessels to dock for 4 to 5 months. Fish protection agencies subtracted all of the illegally caught fish from the allocated quota.

Salmon of Soviet origin were protected on their migratory routes outside the 200-mile zone in the Pacific Ocean. In 1989, as in previous years, Taiwanese vessels caught the salmon illegally. Two Taiwanese vessels were detained by a border patrol ship. By decision of a people's court fines and compensation totalling 779,940 convertible rubles were levied against the violating ships. It should be mentioned that the problem of exacting fines and compensation for losses from Taiwanese fishing vessels has been with us for more than a single year. A Japanese trade firm is presently being used as a channel for operational communication with Taiwan on the execution of the court's decisions.

Fish protection agencies monitored Japanese salmon fishing beyond the economic zone of the USSR under an intergovernment agreement. Ten fish protection vessels, two border patrol ships and an Il-18 DORR [not further identified] aircraft participated in the monitoring. There were 188 Japanese vessels and one mother ship in the fishery. A total of 117 vessels were inspected, and 55 violations of the fishing regulations were discovered, including 52 from aircraft (fishing in a forbidden zone). The salmon quota for the Japanese outside the 200-mile zones of the USSR, Japan and the USA was set at 10,700 tons (8,004,000 fish) in 1989. According to figures from the fish protection agencies, the actual catch amounted to 10,040 tons (7,512,000 of fish, or 93.8% of the quota).

The technical facilities of the fish protection agencies leaves something to be desired. Our nation's fish resources continue to be protected from SRTM-800 and SRTM-1000 vessels. The vessels have a speed of less than 10 knots and their technical specifications do not measure up to the requirements of fish protection work. Practically all of the foreign fishing vessels which fish within the USSR's zone are superior to the SRTMs in both speed and maneuverability. Glavrybvod is outfitting these vessels with landing boats, outboard motors and satellite navigation systems with available currency. A basic reequipment of the fish protection agencies is

essential, however, and the obsolete SRTM class of vessels must be replaced with high-speed specialized vessels.

The fact that there are no real prospects for replacing the vessels is causing great concern. The four specialized vessels to be built in Denmark will in general not solve the problem. (A detailed report on one of them, the patrol vessel Komandor, was published in issue No. 3 of RYBNOYE KHOZYAYSTVO in 1990). The fish protection agencies need 30 specialized seagoing vessels, however. We must immediately resolve the matter of building such vessels in the USSR.

With the conversion of state industry to economic accountability and self-financing, fish procurement organizations of the Far East basin will want to stop assigning vessels to protect the USSR's economic zone without being paid rent. Because of this Glavrybvod should allocate funds for renting patrol vessels.

A very acute situation has developed with respect to the use of aircraft. The waters guarded are extensive, and this cannot be done without aircraft. The IL-14 aircraft, which suited the fish protection agencies in every way, was taken out of production long ago, and only individual aircraft still have some service life left. There is presently no replacement for this aircraft, which was so suitable for use in the national economy. The fish protection agencies have been forced to use the Yak-40 and AN-26, but these aircraft are expensive and are not satisfactory with respect to speed, altitude or range. The USSR Ministry of the Fish Industry should probably join forces with other interested departments and ask the Ministry of Aviation Industry to develop such an aircraft.

Nor has the situation improved with respect to organizing the reception, automated processing and operational transmission of information from foreign fishing vessels to fish protection vessels Dalryba [Far Eastern Administration of the Fish Industry] GPO [state border guard?]. The information is still being processed practically by hand, and its transmission is extremely slow.

There have been advances in the protection of our biological resources, however. There has been a perceptible rectification of foreign fishing, and the maritime sites set up for inspecting Japanese fishing vessels have worked out well. Three such sites are presently operating. There has been improvement in interaction among the fish protection agencies, border troops and the USSR Navy to protect salmon originating in the USSR beyond the borders of the economic zone of the USSR. The raw material stocks have been stabilized in a number of fisheries. According to scientific forecasts, the overall permissible harvest of fish and marine organisms is still fairly high.

Fish protection agencies discovered 263,900 violations of laws protecting fish stocks in 1989, 139,300 of them gross violations, compared with 329,500 in 1987 and 308,400 in 1988. The reduction resulted from the

transfer of fishery and sanitation monitoring of bodies of water to the State Committee for Environmental Protection in 1988. The total amount of suits filed against organizations for damage to fish stocks in the form of fish killed by pollution and in water intake installations came to 15.3 million rubles, and the sum total of the suits filed against citizens in the form of fixed rates for illegally catching valuable species of fish amounted to 4.6 million rubles. A total of 2,871 cases were assigned to investigative agencies for bringing the guilty parties to court on criminal charges.

In 1989 fish-raising enterprises released 3,896,000,000 fish of the valuable species into natural bodies of water and reservoirs (exceeding the plan by 10%), including 96,400,000 sturgeon, 603,500,000 salmon, 3,157,400,000 small-mesh fish and 38,500,000 plant-eaters.

There was a continuation of the work performed to improve the biotechnology for raising fry in order to improve the quality of the fry and the industrial return coefficient in the fisheries, and the feeding of salmon fry was introduced at fish-raising plants of the Far East, which increased the industrial return by an average of 2-2.5-fold. Work is underway to increase the capacities of the fish-raising enterprises and on their reconstruction and technical reequipment.

The data of fish-management science show that 70-80% of the sturgeon catch in the Sea of Azov involves fish released from hatcheries; 26-30% in the Caspian. Acclimatization measures being carried out in the nation assure an annual harvest of around 32,000 tons of fish.

A deteriorating ecological situation is reducing effectiveness. Each year around 200 cases of fish mortality are recorded in various of the nation's bodies of water. Sturgeon larvae and fry die at Astrakhan and Volgograd hatcheries, and the numbers of anchovies and herring have been drastically reduced in the Sea of Azov. However, charges are not always filed promptly and with evidence for losses of fish killed by sudden-discharge pollution, or as a result of defective or missing fish-screens at water-intake facilities, and proper persistence is not demonstrated in the consideration of this information in agencies of the procuracy, arbitration and the courts. Monitoring of the construction of compensating facilities has been relaxed.

In 1989 Glavrybvod helped prepare and consider the draft Law of the USSR on the Protection of Nature, the drafts of the decrees passed by the USSR Council of Ministers "On Measures to Fundamentally Improve the Ecological Situation in the Caspian Sea Basin" and "On Urgent Measures to Normalize the Situation in the Sea of Azov Basin," the Regulations For Protecting Surface Water, the Statute on State Ecological Expert Assessment, the "Methods For Assessing Damage to Fish Stocks..." and many other normative documents.

Glavrybvod continued to work jointly with scientific research institutes to regulate the amount of pollutants

acceptable in fishing waters. Glavrybvod's NTS [Scientific and Technical Council] established the maximum acceptable concentrations (PDK) for 106 substances and the approximate safe levels (OBUV) for 24.

The significant losses suffered by the fishing industry from water pollution demand immediate steps to enhance the protection of inland bodies of water and the coastal waters of seas from the effects of man's activities. The resolution of these problems was made more difficult, however, by the transfer of environmental protection functions to USSR Goskompriroda agencies.

The Ministry of the Fishing Industry turned over to Goskompriroda and its local agencies 40 units of the central organization (50% of the former Glavrybvod system) and TsUREN [Central administration of reconnaissance and ecological oversight?] (50% of the total system), 1,170 staff members of the basin directorates, 3.7 million rubles allocated for their wages, 104 special automobiles, 34 trucks, two SChS-150 maritime fish protection vessels, 30 diesel-powered lake boats, 64 boats with fixed gasoline engines, 138 outboard motorboats, 482 tons of the gasoline stocks for 1989 and 116 tons of the diesel supply for 1989.

As a result, the Glavrybvod and TsUREN administrations which performed preventive oversight and expert appraisal of projects were eliminated. A significant reduction in operational sanitation and fish industry oversight and the halting of fish industry evaluations of projects by the basin administrations and TsUREN have reduced the influence of fish protection agencies on the implementation of measures to protect fish stocks by industrial, agricultural and municipal facilities.

It should be noted that Glavrybvod continues to receive plans for the development and distribution of production forces of the USSR, plans for the development and distribution of individual sectors of the national economy, plans for the comprehensive use of water resources, nature protection plans and plans for the construction of individual projects from various ministries and departments, even though there is no one to consider them either in Glavrybvod, in TsUREN or in the basin administrations of the fish protection agencies.

The Ministry of the Fish Industry also has an interest in seeing to it that in their economic work in the bodies of water, ministries and departments work out and implement measures to preserve conditions conducive to the natural reproduction of fish stocks and other biological resources. It would therefore be a good thing to set up in the VNIRO [All-Union Scientific Research Institute of Sea Fisheries and Oceanography] (or some other institute of the USSR Ministry of the Fish Industry in Moscow) a special subdivision with at least 10 members to review these materials in the interest of the fish industry.

By a decree of the party and the government on the fundamental restructuring of nature protection in the

nation, USSR Goskompriroda was assigned the functions of state monitoring of the protection and use of fish stocks, aquatic animals and plants in inland bodies of water and territorial waters of the USSR, on the continental shelf and in the economic zone of the USSR. The same decree charged USSR Goskompriroda with the function of issuing permits for using the animal world, including fish stocks, which is an integral part of fish industry management. At the same time the actual protection of fish stocks is still the function of the USSR Ministry of the Fish Industry.

Due to the imprecise wording of this decree, Goskompriroda and the Ministry of the Fish Industry have for 2 years argued over who has authority to manage the fish industry and protect the stocks. The USSR Council of Ministers, the USSR Ministry of Justice, the USSR Academy of Sciences and other departments have been drawn into the dispute. The situation has complicated the work of regulating fishing and weakened the protection of fish stocks.

USSR Goskompriroda and the USSR Ministry of Justice have presently submitted a number of draft enactments to the USSR Council of Ministers calling for removing from fish protection agencies their authority to bring violators of fish protection laws to administrative and material accountability.

Since it is impossible effectively to protect fish stocks without the authority to punish violators of the law, the adoption of these enactments could lead to a total breakdown of the system of fish protection agencies. Repeated appeals on the matter to the USSR Council of Ministers by the USSR Ministry of the Fish Industry have not yet had a positive outcome.

In addition to difficulties in relations with Goskompriroda, the work of fish protection agencies has recently been complicated by relations with the ispolkoms of the local soviets of people's deputies.

With the conversion to regional economic accountability and increased authority for the soviets of people's deputies, the latter are assuming functions not their own and making decisions which are in conflict with existing laws. This applies to the revision of the Fishing Regulations without the participation of fish protection agencies, the revision of established ceilings on catches in the fisheries and the transfer of bodies of water to the use of secondary fish procurers. Actions taken by the Tyumen, Kamchatka and Chelyabinsk oblast ispolkoms are an example. Attempts to divide up the economic zone of the USSR (Estonia and Kamchatka) according to administrative territory pose a special danger to the fish industry. It will inevitably lead to the fragmentation of resources in the economic zone to suit localized interests and ultimately, to their detriment.

Unresolved problems with respect to materials and equipment support for the fish protection agencies are also having a significant effect upon the effectiveness of measures to protect fish stocks and combat poaching.

The state fish protection inspectors have at their disposal motor vehicles, motorboats and launches. Delays in the replacement of worn-out transport, radio and other kinds of equipment and equipment which has used up its service life, and limited allocations of gasoline make it difficult for the fish protection agencies to perform their job of protecting and reproducing fish stocks. The 40-45 motor vehicles allocated by USSR Gosplan for the fish protection agencies annually does not cover 10% of their need. In 1989 not a single passenger car was allocated for the use of Glavrybvod. The number of Vikhr and Neptun outboard motors allocated has been sharply reduced in the past 5 years. They have a short service life (500-700 hours), and 1,500-1,700 of them are needed annually to replace worn-out motors. During the past 3 years practically none of the outboard motors so needed by Glavrybvod have been allocated.

Despite the fact that the USSR Council of Ministers has ordered USSR Gosplan and the corresponding ministries to take steps to improve the provision of fish protection agencies with transport and other equipment, there has still been no decision on the allocation of motor vehicles, motorcycles and outboard motors.

A lack of legal protection for state fish protection inspectors also makes it difficult for them to combat malicious poaching, a fact particularly apparent in 1989, when there was a drastic increase in crime in the nation. Eight state fish protection inspectors were killed in the performance of their official duties. This included four killed while arresting malicious poachers, three of them with firearms. Three other inspectors were wounded and disabled in a skirmish with poachers. At the same time law-enforcement agencies have become less persistent and demanding in halting malicious actions by poachers. Many cases involving malicious violators are submitted to labor collectives for consideration, as a result of which malicious violators of fish protection laws go free of criminal liability.

The USSR Ministry of Justice reports that it has repeatedly discussed the matter of increasing criminal liability for attempts upon the life or health of an individual while he is perform his official or public duty, as well as the life or health of close relatives of such a person. The draft new Criminal Code of the RSFSR will specify increased liability for murder or serious bodily injury.

The matter of increasing the wages of workers with fish protection agencies has also been dragged out. The official salaries of Goskompriroda have until quite recently been twice those of workers with fish protection agencies performing identical jobs.

The uncertain situation of fish protection agencies, their low wages and lack of social and legal protection have caused extensive loss of specialists. More than 1,700 specialists (mainly inspectors), or 17.6

of the total, quit in 1989 alone.

The positive resolution of these and other problems will help Glavrybvod to perform efficiently and protect the fish stocks.

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Expedition Leader Summarizes Black Sea Pollution Study

*90WN0195A Moscow VODNYI TRANSPORT
in Russian 12 Jun 90 p 2*

[Interview with Doctor of Physical and Mathematical Sciences Vitaliy Pavlovich Keondzhyan, expedition leader, deputy director of the USSR Academy of Sciences Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy, and director of the Ekosi firm, by V. Uzelman: "Black Days on the Black Sea"]

[Text] It appears that there is more to be said about the ecological condition of the Black Sea. And how much has been said and written about it lately! This makes all the more interesting new data received from the multi-purpose ecological expedition of the scientific research ship "Academician Boris Petrov" under the USSR Academy of Sciences, which was conducted as part of the international program "Eco—Black Sea 90." Discussing the findings with our correspondent is the man who headed the expedition, Doctor of Physical and Mathematical Sciences V.P. Keondzhyan, deputy director of the Academy of Sciences Institute of Geochemistry and Analytical Chemistry and director of the firm Ekosi.

[V.P. Keondzhyan] You will agree that there has long been a prevalent opinion, strongly supported in our own country as well as by municipal authorities and state agencies in Bulgaria, that the pollution of the Black Sea is due primarily to the discharge from the rivers of Northern Europe, and that the Bulgarian coast is primarily a victim of the waters of the Danube. In short, it was widely assumed that all the pollution came from the Danube. One of the main questions to be addressed by the expedition was: How much of the pollution of the Black Sea comes from the Danube, the Dnepr, and the Dnestr Rivers? The findings were truly sensational.

It turned out, for example, that the amount of pesticides in the drainage from the rivers of Northern Europe, which for the last decade have been known only as garbage, were 50 times less than along the Bulgarian shoreline! This is a catastrophic figure, which reveals the amount of pesticides being used in Bulgaria. Moreover, in the Gulf of Burgas, which is partially land-locked, their share of man-made contaminants amounts to 90 percent. That is, to put it simply, 10 percent of the pollution there comes from the outside—the rest is produced locally.

Speaking of the Gulf of Burgas, I must say that it would be difficult to find anything in other regions like the amount of phenol compounds and related products that

are provided generously to the sea by the Burgas Petrochemical Combine. Their concentrations are 50-60 times the maximum allowable limits.

It is a bad situation also with respect to heavy metals such as zinc, lead, tin, and copper. Runoff wastes from stock farms, which, for example, in the past year have carried uric acid 18 times above the allowable limit into the gulf, present a considerable danger. Why do I cite these figures? To emphasize once again the fanciful nature of previous assertions that all the contamination was coming from the Danube.

One other finding that was surprising confirmed the fact that very serious changes have occurred in the Black Sea in connection with the arrival in the ecosystem of a "newcomer" from America, dog's-tail grass [grebnevik], the population density of which in the past year and a half has grown to catastrophic proportions. It now exceeds the population of jellyfish and competes successfully with the fish for plankton, thereby depleting their stocks. The biomass of dog's-tail grass has already reached 40 percent of the total biomass of the Black Sea. And the most frightening thing about it is that there is no antidote to it in the form of a natural predator, so that it continues to devour everything around it.

[V. Uzelman] Vitaliy Pavlovich, a question of urgent concern to virtually everyone since the moment following the Chernobyl catastrophe: What is the amount of radioactivity in the Black Sea?

[V.P. Keondzhyan] The question is entirely understandable because people fear radioactivity more than anything else: after all, man can defend himself against everything except radioactivity. Following the Chernobyl disaster the radioactivity of the water rose sharply and in 1986, according to the UkSSR Academy of Sciences Institute of Marine Hydrophysics, surface radioactivity reached 600 Becquerels per cubic meter in an area extending from the southern coast of the Crimea almost as far as Turkey. There was radioactivity, too, in Bulgaria, where the greatest concentration of cesium oxide 137 in the water amounted to 250-300 Becquerels per cubic meter.

The situation now in the upper levels is significantly better. Long-lived radionuclides are now sinking at a rate of about 15-20 meters per year. Since the amount of radioactive fallout since Chernobyl remains unchanged, a redistribution of these particles is taking place. Whereas earlier the maximum radioactivity was to be found in the upper 5-meter layer, now cesium is concentrated for the most part at a depth of from 50 to 70 meters. The fact that cesium is breaking down in the water does not in itself mean that it is being taken out of the ecological system of the Black Sea. Fortunately, this is simply a convenient form of conservation. Inasmuch as the half-life of cesium is 32 years, but decontamination requires six of these disintegration periods, it will be 180 years before the presence of cesium may be said to have disappeared.

Along the coast of Bulgaria, our data indicates that the cesium content is about 20 Becquerels per cubic meter; and in spots where it was formerly 300 Becquerels—about 30 Becquerels.

[B. Uzelman] How reliable is the data?

[V.P. Keondzhyan] The measurements of radioactive contamination in the water, for example, were made with two independent methods, the results of which were close to one another, so that there is no reason to doubt their reliability. On board the "Academician Boris Petrov" these methods and methodologies were designed especially to include a maximum number of variables to indicate the condition of the Black Sea. There were physicists, chemists, and toxicologists, as well as other specialists; and in addition to routine measurements to find the content of oxygen, nitrogen, and other elements present, which are to be expected in an aquatic environment, special attention was given to factors conditioned by man and modern technology. In all, the research took into consideration about 50 parameters.

A special detachment of researchers was also on board to analyze the data—that is, to determine what all the information indicated in its totality. It should be understood that the indicator most commonly used today—I am referring to the maximum permissible concentration (MPC)—is unable to give a true and complete picture; for it is based on the assumption that the water contains no other components than the ones that are being measured. But the water has a host of chemical substances that continuously interact upon one another. We may have components substantially below the MPC which can become poisonous pollutants in terms of their total toxicity.

Then the expedition also passed close to the coastal areas, and we conducted our research in the north-western and western sectors, which may well lay claim to the name of ecological disaster zones.

[V. Uzelman] What general conclusion did you come to about the condition of the Black Sea?

[V.P. Keondzhyan] Let me put it this way. In the coastal areas it is approaching crisis conditions. Man-made pollution of the Black Sea has reached a very high level. Let us not lose sight of the fact, moreover, that the Black Sea does not mix to any considerable extent with the rest of the world water supply; and that although at one time it could be counted upon to purify itself, and the contamination in it could not be considered large by comparison with the size of its natural tributaries, today the amount of pollution in a number of regions, as we have demonstrated, exceeds its capacity for self-purification, and the ecological system is in danger of being thrown out of balance. In Odessa Bay a reddish efflorescence of plant life may already be seen. In addition of a number of other harmful characteristics, this condition is leading to illnesses on a massive scale of people who come into contact with the water as well as the algae. New forms of

illness are developing. On the Bulgarian coast, for example, outbreaks have been reported of skin ailments, lasting from a week to a month in some instances, sometimes leading to irreversible alterations in skin pigmentation.

[V. Uzelman] Has not the time come then to declare these areas ecological disaster zones?

[V.P. Keondzhyan] That is a difficult question. International environmental protection organizations have devised special criteria for determining ecological disaster zones. We still do not use these criteria. This we may do after examining the situation, establishing the sources of pollution, identifying their characteristics, and analyzing the total synergistic effect, thus arriving at a specific answer to this question. Even now it is possible to speak of certain areas. In the Odessa area, for example, pollution from petroleum products has reached catastrophic proportions, and it is possible to find practically every sort of intestinal parasites because of the discharge into the sea of domestic sewage and other waste without purification. Thus it is possible to assert at virtually the level of demonstrable proof that the Odessa area, as well as the runoff areas of the Danube River (near Zmeinyy Island), the Gulf of Burgas, and possibly Varna Bay have every right to be called ecological disaster zones. I want to emphasize that I am speaking only of the regions visited by our expedition. I can say nothing, for example, about the Sochi area.

[V. Uzelman] Vitaliy Pavlovich, now that the expedition is over, what lies ahead?

[V.P. Keondzhyan] The expedition was originally proposed by the movement Eco-Forum for Peace, which in October of this year suggested holding a conference with the participation of a wide range of specialists to attract the attention of mankind to the tragic condition of the Black Sea. Our expedition was to provide the scientific foundation for the marine part of it. The USSR Academy of Sciences Institute of Geography is currently conducting an expedition along the coast and will also present its findings.

In the course of the expedition we had many meetings and discussions, particularly in Burgas, where we presented our recommendations to the local authorities and economic managers. For us this was the main thing since we are concerned with matters of practical ecology rather than basic research. But before building any purification facilities, it is necessary to find out what needs to be purified—what elements in the "mix" of those that have been discharged into the water are the most toxic. If we can succeed in removing the ones with the greatest toxicity, this will substantially lengthen the life of the drainage basin.

To determine toxicity in terms of its ecological characteristics in the water, new methods are needed. These are now being devised in our companies. Standardized criteria will enable us to determine what must be purified in

terms of priority. In general, everything is need of purification, but we must be realistic—we do not have the money for everything.

The protection of the environment is such a complex problem that to resolve it by means of one method alone is impossible. It cannot be done except in coordination with economic and other kinds of decisions. We look upon our role as one of assisting leaders to make the right policy decisions. We must not underevaluate the political and social dimensions. But we can deal with this subject in a separate discussion.

It is extremely difficult to halt the pollution of the environment not only because it requires great expenditures of funds for the modernization of technology, but because it requires as well the upgrading of technological science and training institutions. And this is a very slow process. Nevertheless, such measures must be undertaken. The Americans brought Lake Erie back to life at a cost of \$100 billion. By comparison, the trip by the U.S. astronauts to the moon cost \$36 billion. It is clear to everyone that the less an illness is neglected, the easier will be the cure. Today, for example, the cost of purification treatment of the Gulf of Burgas is from 100 to 150 million Bulgarian leva. If treatment is delayed a few years, however, the cost may increase threefold. The situation is much the same in Odessa. An ecological breakdown has occurred there that by all indications is irreversible. Our country now faces the very difficult task of saving Odessa Bay and other maritime regions as well.

Scientist Explains Ecological Map of Black Sea, Sea of Azov

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19 Jun 90 p 4

[Article by Yu. Zaytsev, UkSSR Academy of Sciences corresponding member, Odessa, under the rubric "Ecology": "The Colors of Disaster: Ecological Portraits of the Black Sea and the Sea of Azov From Outer Space"]

[Text] Hundreds if not thousands of different kinds of harmful substances are today entering the seas and oceans. Among them are some whose impact upon the marine environment is particularly discernible. Organic and mineral fertilizers belong to this category of contaminants. These seemingly innocuous substances, when they turn up in the sea in excess amounts, can do more harm than powerful chemical compounds that are known to be toxic. They enter the water supply in river water carrying drainage from populated areas, industrial enterprises, stock farms, and the like.

What does all this lead to? The fertilizer in the sea stimulates a hyperactive reproduction of microscopic plant life—phytoplankton—in the depths of the water. In this instance we may speak of the malignant growth of biological productivity in the marine environment. With an excess amount of plankton, the water becomes turbid; so the algae at the bottom, deprived of solar energy, tend to wither and die.

But this is not the most dire consequence of efflorescence. A worse one is yet to come when after a short period of vegetation (two or three weeks), the phytoplankton die and settle at the bottom. Such an event occurs at all times, but whereas previously a few grams per square meter in all settled on the bottom, today from ten to a hundred times that amount accumulates.

These algae decompose; for they require oxygen dissolved in the water, and in the layers near the bottom a state of oxygen deficiency (hypoxia) occurs. As a result, the fish who live at the bottom die. In other words, a process of mass asphyxiation takes place, and this has become the major disaster that has befallen shallow-water (shelf) areas of the seas during past decades. For each square kilometer at the bottom that suffers from hypoxia, from 100 to 200 tons of living creatures perish—among them, mussels, oysters, shrimp, crabs, bullheads, flatfish, and young sturgeon.

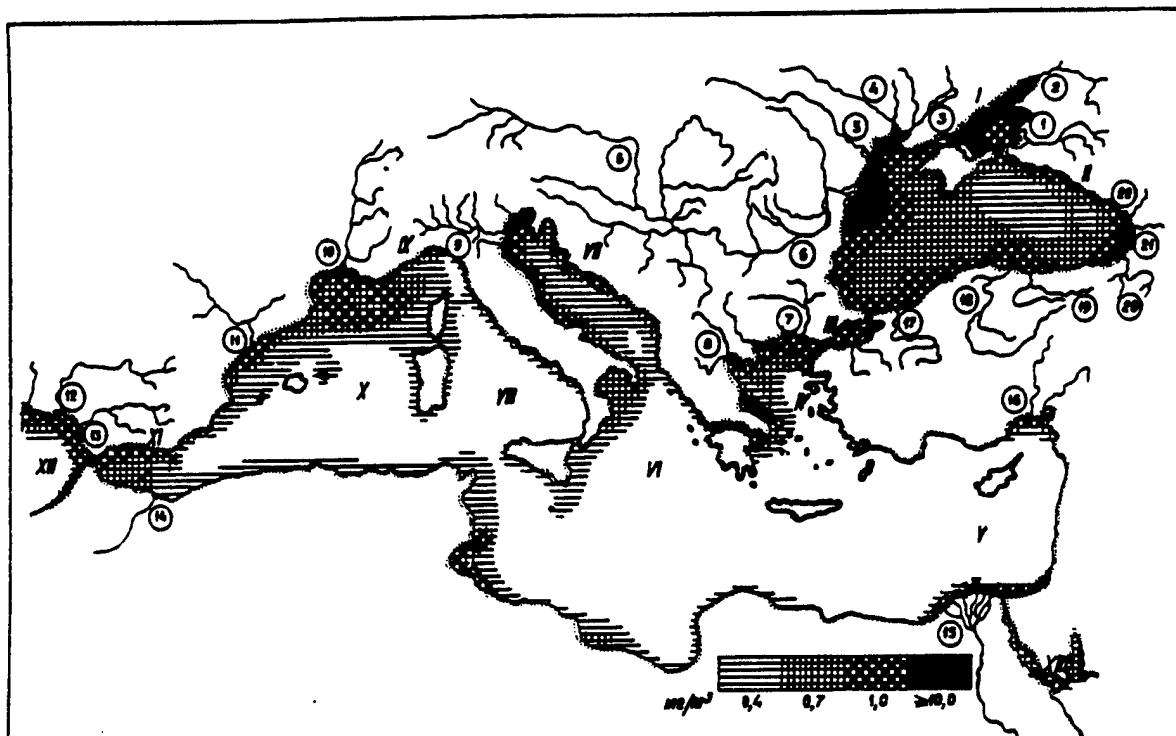
The large-scale decomposition of organisms, from one standpoint, enriches the sea water with nutrients for bacteria. From another standpoint, however, it fills it with a gas, hydrogen sulfide, which is toxic for most living creatures. (This is a process generally to be observed at greater depths.)

Not all regions of the Black Sea and the Sea of Azov, however, are subject to efflorescence and asphyxiation to the same degree. In some areas this phenomenon reoccurs each year with varying degrees of intensity; in others it is observed much more infrequently; and there are areas where it is virtually unknown. It is by pinpointing the locations of the first, second, and third areas that it becomes possible to make accurate assessments of the ecological situation and so make the decisions needed to protect the marine environment and its inhabitants.

Information of this kind is available on marine ecological maps compiled by scientific research ships. Marine research surveys, however, have one distinct drawback. A considerable amount of time is required to survey large bodies of water and analyze the data collected. The various parameters indicating the marine environment are subject to substantial change between the start of an expedition and its conclusion, so that maps compiled in this way may present distorted data.

Another way to survey the environment is from space vehicles. In terms of data collection of these variables, satellites still lag well behind what can be accomplished in marine expeditions, particularly aboard large well-equipped vessels. But the speed with which data can be collected largely makes up for this deficiency and makes it possible to collect comparative data over vast areas of the world's oceans. The intensity of marine efflorescence, for example, may easily be determined from the amount of chlorophyll, the green pigment contained in the cells of phytoplankton, which may be measured accurately with special instruments on satellites designed for oceanographic research.

Chlorophyll Distribution in Seas and Rivers of the Mediterranean Basin (in milligrams per cubic foot)



УСЛОВНЫЕ ОБОЗНАЧЕНИЯ НА ЭКОЛОГИЧЕСКОЙ КАРТЕ

Распределение вод с различным содержанием хлорофилла (мг/м³) в морях и реках Средиземноморского бассейна.

МОРЯ: I — Азовское, II — Черное, III — Мраморное, IV — Эгейское, V —

Левантинское, VI — Ионическое, VII — Адриатическое, VIII — Тирренское, IX — Лигурийское, X — Альберанское, XI — Альберанское, XII — Атлантический океан, XIII — Красное.

РЕКИ: 1 — Кубань, 2 — Дон, 3 — Днепр, 4 — Южный Буг, 5 — Днестр.

6 — Дунай, 7 — Маритца, 8 — Вардар, 9 — По, 10 — Рона, 11 — Зоро, 12 — Гвадана, 13 — Гвадалкививир, 14 — Муллуя, 15 — Нил, 16 — Днишкан, 17 — Сакарья, 18 — Кизил-Ирмак, 19 — Ешил-Ирмак, 20 — Чорох, 21 — Рioni, 22 — Ингури.

Key: SEAS: I—Sea of Azov, II—Black, III—Sea of Marmara, IV—Aegean, V—Lebanon, VI—Ionian, VII—Adriatic, VIII—Tyrrhenian, IX—Ligurian, X—Algeria-Provence Basin, XI—Alboran, XII—Atlantic Ocean, XIII—Red. RIVERS: 1—Kuban, 2—Don, 3—Dnepr, 4—Southern Bug, 5—Dnestr, 6—Danube, 7—Maritsa, 8—Vardar, 9—Po, 10—Rhône, 11—Ebro, 12—Guadiana, 13—Guadaquivir, 14—Moulouya, 15—Nile, 16—Ceyhan, 17—Sakarya, 18—Kizil Irmak, 19—Eshil Irmak, 20—Chorokh, 21—Rioni, 22—Inguri.

The following schematic map of waters of the Mediterranean basin has been compiled by the author on the basis of published information from space photographs taken by U.S. and Soviet satellites, supplemented with data obtained from marine expeditions by various countries.

Along the broad expanse of waters from the Straits of Gibraltar in the West to the Sea of Azov in the East, the areas may be seen that contain significant quantities of chlorophyll. This condition is particularly characteristic of regions adjacent to the mouths of rivers. The Black Sea and the Sea of Azov, however, are sharply distinguished on the map from all the other seas of the Mediterranean Basin by the amount of black and cross-hatching. The southeastern and especially the northwestern part of the Black Sea together with the entire Sea of Azov are the most over-fertilized aquatic areas of the Mediterranean Basin and are distinguished by the number and biomass of phytoplankton. This situation is

to be explained by the discharge of major rivers flowing into these seas as well as the limited amount of intermingling with the other seas of the basin through the narrow straits of the Bosphorus and the Dardanelles.

The map indicates that the entire Sea of Azov and the waters off the shores of Odessa, Nikolayev, and Kherson Oblasts in the northwestern area of the Black Sea are over-fertilized. Waters in a similar condition are to be found off the shore of Adzhariya, but there the water contiguous to the shelf is much deeper and the coastal waters can mix with the less fertilized waters of the open sea. The Sea of Azov and the shoal waters of the northwestern shelf of the Black Sea have no such opportunity. There in hypertrophied form are all the signs of the so-called "eutrophic syndrome"—efflorescence, hypoxia, and asphyxiation.

The black expanse on the map does not in itself indicate the inevitable extinction of marine life. It indicates that the sea water in these areas is already saturated with

fertilizers, and even a fairly small additional amount of fertilizer therefore (as from an accidental seepage of sewage, a sudden washout of fertilizers from the fields, or a high density of vacationers on the beaches without proper sanitary facilities) can trigger the chain reaction of eutrophication, resulting in a number of ecological disasters along the coastal waters of the sea.

The thick black and cross-hatching on the map indicates the areas in need of priority attention and requiring radical measures to ameliorate the conditions of the waters represented. A description of each of the measures called for may form the subject of a separate discussion. Here, we shall limit ourselves to enumerating them.

Throughout the drainage area of the rivers that empty into the Black Sea and the Sea of Azov, it is necessary to provide for a technology for industrial and agricultural production that will guarantee that mineral and organic fertilizers do not get into the rivers. In ports, population points, and recreation areas along the coast, it is necessary to provide for thorough purification of water draining into the sea. The "unburdening" of the sea of the fertilizers that get into it (as well as other substances of no less importance) may be carried out by methods of so-called hydrobiological reclamation, which includes large-scale cultivation of aquatic plant life, mollusks, and other organisms to be used in collecting these substances, along with a "harvest" of raw materials on shore to be used in a variety of valuable products for animal or human nutrition, pharmacological purposes, or some other technological purpose.

The transformation of the Black Sea and the Sea of Azov into ecological disaster zones took place during the period of the past three or four decades as a result of the "best efforts" of the countries situated in these drainage basins. In the case of the Black Sea, for example, it includes eight nations of Europe and Turkey. Rectification of this situation therefore presupposes a joint international effort.

Such work is not simple or easy; nor can it promise rapid results. But it is the most realistic way to restore the Black Sea and the Sea of Azov to its former state as a fishing ground of renown and a reservoir of good health.

Georgian Environment Chief on Black Sea Pollution Problems

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No 4, Apr 90 pp 60-68

[Article by Shota Ivanovich Chalaganidze, chairman of the Georgian State Committee for Environmental Protection and the Timber Industry: "The Black Sea and the Ecology"]

[Text] The ecosystem of the Black Sea, just like any natural ecosystem, has the capacity to endure periodic heavy or severe anthropogenic loads. Therefore, for a

long time the development of traditional kinds of economic activity did not lead to any serious conflicts at all; that is, the peace of the seashore regions was not disturbed by the vacationers and tourists, the shores largely undisturbed by the sea, and the sea received little pollution from the shores. However, the situation began to change markedly in the post-war years, when man's economic activity assumed a scale incompatible with the actions of and the natural factors.

According to data published in the press, from the territory of the Soviet Union alone every year an entire river of poison empties into the Black Sea—over five billion cubic meters of sewage. In the last few decades alone this stream has become nearly twice as powerful. The sea, although it is large, is beginning to choke, for it is unable too purify that which the industrial and agricultural enterprises are casting off. The situation is aggravated by the fact that the Black Sea is one of the most closed water basins in the world. The straits connecting it with neighboring seas are very narrow, and therefore the exchange of its entire water mass is possible only once in 2,250 years.

The gradual degradation of the waters of the Black Sea began long ago, when humus began to wash into it from the neighboring cultivated fields. This process has intensified greatly in the last three decades, after the intensive spread of populated places on the Black Sea coast, the increased dumping of fecal materials and waste waters saturated with organic materials into the sea. Phosphates, nitrates and hydrosulfuric compounds, harmful to the life of sea organisms, and the decay of these organic wastes, saturated the upper layers of the sea water in ever-increasing amounts, raising the ceiling of the so-called "dead zone," which today has come within 150-200 meters from the present surface of the sea.

In practical terms this means that the functional bottom of the Black Sea is now at a depth of 200 meters. Only this zone is suitable for the development of oxygen-using inhabitants of the sea. The remaining, lower depths on the order of 1,800 meters are inaccessible to the live environment. At the same time the rapidity at which this dead zone is moving threatens danger. In the past four decades its upper boundary has soared upwards an entire 70 meters. If the movement to the surface of this ceiling continues at the same rate, by the end of the year 2040, the Black Sea will be completely dead.

Therein lies the primary reason for the increasingly catastrophic death rate of Black Sea mussels, bonito, mackerel, flounders, and other typical Black Sea fish and animals, which until recently had fed the population of the Black Sea coast. If to this one adds the often rapacious exploitation of fish reserves and the destruction of the dolphins, a still more unpleasant picture emerges. Thus, according to data from the International Alliance for the Protection of the Environment and Natural Resources [MSOP], by now 70 percent of the sea spawning grounds have already become unsuitable for the development of fingerlings, 25 percent of the most

valuable industrial varieties of fish have been completely annihilated, or their numbers have sharply declined because of constantly increasing catches. This pertains to such varieties as herring, cod, mackerel, many varieties of sea perch and so on. And every year 250,000 dolphins are destroyed.

The CPSU Central Committee and USSR Council of Ministers Resolution, "On Measures to Forestall Pollution of the Basins of the Black and Aral Seas," was adopted back in 1976. The councils of ministers of the RSFSR, the Ukraine, Belorussia, Georgia and Moldavia together with the interested ministries and agencies of the USSR were instructed to implement a complex of measures which would ensure the complete halt of dumping of untreated domestic and industrial waste waters into the watersheds of the basins cited, by means of introducing progressive production technology, which would prevent the pollution of the outer environment, comprehensive processing of raw materials, utilization of industrial wastes, and construction of effective purification installations and purification facilities.

A number of measures were implemented in Georgia in execution of the indicated resolution. For the purposes of focusing the efforts and means directed toward protecting the watersheds of the Black Sea Basin, and specifically for improving construction of sewage and purification installations in towns and populated areas, the functions of sole client were bestowed upon the Main Administration for Capital Construction at the Republic Council of Ministers (At the present time it is situated in the system of the Georgian Goskomstroy [Main Construction Administration]); while the Gruzspetstroy [Georgian Special Construction] Trust and the Gruzspetstroyrem [Georgian Special Construction and Repair] Administration were established at Gosstroy [State Construction Administration] and Gosagroprom [State Agroindustrial Committee]. The Gruzvodokanal [Georgian Water Main] Administration was designated the sole administrator of the purification facilities in the system of Minzhilkombinat [Ministry of the Housing and Municipal Services]; and for conducting shoreline-reinforcement and beach-formation work, the Gruzbergozashchita [Georgian Coastline Protection] Administration was formed. The Batumi Specialized Subdivision for Elimination of Spills of Petroleum and Petroleum Products into the Sea was formed at the Georgian Steamship Co.; and for implementing control of work on preservation of sea waters, specialized maritime inspectorates were established in the Georgian Goskompriroda [State Environmental Protection Agency] system in Sukhumi, Batumi and Poti.

More than 100 million rubles of capital investment were assimilated for water-preservation construction. Purification facilities were built for municipal and domestic waste water for 20 cities and populated points with a total planned capacity of 647,500 cubic meters per day, as well as water preservation installations at a number of

major industrial enterprises—the Gruzbumprom [Georgian Paper Industry] Production Association, the Chiatura Manganese Production Association, the Kutaisi Automotive Plant, the Tkvarcheli GRES [State Regional Power Plant], the Kvaisi Lead and Zinc Ore Administration, the Zestafoni Iron Smelting Plant, and others, which has permitted reducing the dumping of unpurified waste water into the Black Sea Basin by more than 60 percent.

The Batumi Central Petroleum Transfer Base is accepting and treating ballast water from all native and foreign vessels calling at the republic's ports, as well as lyalnye vody [possibly—mineral-laden water], which is delivered to the ports of Batumi, Poti and Sukhumi.

The Georgian Steamship Co. and the Gruzrybprom [Georgian Fishing Industry] Production Association have developed and are consistently implementing plans coordinated with the Georgian SSR State Environmental Protection Committee for providing additional water-purification equipment to ships and other seagoing vessels in accordance with the MARPOL Internal Convention.

In spite of the work being carried out, the sea remains in grave condition. The volume of polluted and insufficiently-treated waste waters entering the watershed of the basin amounts to 90 million cubic meters per year.

From these sources, the rivers and the coastal strip of the sea receive up to 13,400 tons of suspended materials, 743 tons of petroleum products, 5,500 tons of organic materials, 3.1 tons of ammonium nitrate, .95 tons of heavy metals, and so on.

Even extremely rough calculations show that discharge of these materials alone causes losses to the state of more than 2.5 million rubles a year. And this does not take into account the bacteriological pollution of the sea waters, which in recent years has shown a tendency for growth.

In fact, in recent years vacationers on the Black Sea coast have from time to time received various kinds of warning notices, and in certain places it is even suggested that people refrain from bathing in the sea. Unfortunately, all these alarms are far from groundless. From a biological point of view the Black Sea is highly vulnerable, since its lower water layer is quite isolated from the upper, and total exchange of water occurs only once in several decades. Water pollution from river discharge along the coastal zone of the Black Sea takes place also because of the direct discharge of untreated domestic waste waters from cities and populated points situated along the coast.

Nearly two-thirds of the polluted wastes pouring into the Black Sea basin are attributable to municipal services.

The Resolution of the Georgian SSR Council of Ministers of 17 April 1984 approves the "General Plan for Sewage Systems for Cities and Populated Places of the

Black Sea Basin, Situated on the Territory of the Georgian SSR," which takes in 55 cities and populated places. The total estimated cost of construction of the water-conservation installations indicated amounts to 179 million rubles. However, the Georgian SSR Council of Ministers, within the limits of the established ceilings for capital investments throughout the "Sewage System" branch (in consideration of proportional sharing), annually directs only 5-7 million rubles for water conservation construction. In addition, because of the reduction of ceilings for capital investments allocated by USSR ministries and agencies for non-manufacturing construction and the annual ceilings which they transfer to the republic in the form of proportional participation in the construction of water-conservation installations non-manufacturing construction have been greatly reduced. At this rate, completion of measures for completely stopping discharge of untreated waste waters will not be achieved not only in the 12th, but most likely not in the 13th Five Year Plan either.

Therefore we believe that the republic Gosplan, Gosstroy and Minzhilkombyt must draw up specific proposals for increasing the ceilings for capital investments for the construction of sewage systems and treatment installations for the waste waters of cities and populated places.

Things are even worse with the allocation of capital investments for water conservation construction, which are getting smaller every year among the republic's ministries and agencies. For example, in 1985, 1.9 million rubles were allocated for construction of water conservation facilities at projects which are now under Georgia's Gosagroprom; in 1988 the figure was 1.1 million rubles. The percentage of assimilation of allocated assets is declining as well: from the sums set aside for 1985, 1.3 million rubles were assimilated; in 1988, 0.23 million rubles. And this, in spite of the fact that several years ago, a Spetsstroyrem administration was established in the Gosagroprom system for carrying out work on construction and reconstruction of water conservation facilities at Gosagroprom projects. The situation is no better in other ministries and agencies in the republic.

On the whole, whereas from 1976 through 1986 the volume of capital investments assimilated for water conservation construction in the Black Sea and Azov basins amounted to 3.5 billion rubles for the USSR, 256 million rubles were assimilated for Georgia during that period.

The second question: what sort of positive effect was achieved as a result of the operation of treatment facilities constructed, as stated above, in 20 cities in Western Georgia? Unfortunately, not one of them, with the exception of Tskhaltubo, has completely halted the dumping of untreated waste waters. The majority of the city treatment installations are operating at a low degree of effectiveness, and do not provide normative treatment of wastes.

For example, Batumi's treatment installations were accepted for operation by the State Acceptance Commission in 1982 (Client for construction was the UKS [Capital Construction Administration] at the Adzharskaya ASSR Council of Ministers, and the general contractor was the Gruzspetsstroy Trust of the former GSSR Minstroy). The project was accepted with a rating of "good," but as early as June 1983 an official document was drawn up on incomplete construction and installation matters and defects in the treatment facilities, consisting of 159 points. To this day, that is, more than five years later, the unfinished work has still not been completed, as a result of which the operation of the biological stage has not been regulated.

In 1980 the State Acceptance Commission accepted for operation the treatment installations for domestic sewage in Kutaisi (Client—Kutaisi Automotive Plant; general contractor—the Gruzspetsstroy Trust). This project too was accepted with a number of construction and installation items defective or not completed, as a result of which the biological stage does not work, and the mechanical stage operates with large interruptions.

The treatment installations at Lanchkhuti were accepted for operation by the State Acceptance Commission in 1984 (Client—the Guriya Plant; and the general contractor—the Gruzspetsstroy Trust). At the time of acceptance, work had not been completed on all major components. To the present day work on eliminating the unfinished items has not been completed, and the installations do not, for all practical purposes, work.

Major overhauls of treatment installations are not organized on a timely basis. For example, the treatment facilities in Sukhumi, which were put into operation in 1981, has not had a major overhaul once. The situation is about the same at treatment facilities in Zestafoni, Zugdidi and elsewhere. As a rule, the skills of the service personnel at the treatment facilities are rather low.

As a result, at a number of projects the degree of waste water treatment does not correspond to the planned indicators. Thus, the operating effectiveness of the treatment facilities in Batumi does not exceed 50 percent; in Sukhumi, 33; in Poti, 30; in Zestafoni, 15 and in Zugdidi, 40 percent—whereas installations of this type must ensure a degree of treatment not lower than 80 percent.

In addition, the cities in which treatment installations have been built, with the exception of Tskhaltubo, have not completely halted the dumping of untreated waste water, since at the time construction of the treatment facilities was being planned, they did not as a rule plan for the simultaneous development of the sewage system nor for putting outlet collectors into operation.

It is not surprising that the treatment facilities built in towns and cities in the Black Sea Basin are operating at only 60 percent capacity (in Batumi, at 70 percent capacity; in Sukhumi, 65; in Samtredia, 30; in Poti, 25; in Ozureti and Kobuleti at 15; in Gali, at ten percent;

while the treatment facilities at Leselidze, Gantiadi, Gudauta-Novyy Afon and Lanchkhuti do not receive waste water at all).

Significant amounts of untreated waste water is released into the sea, rivers and the underground water table from these cities (in Batumi, 30 percent; in Kobuleti, 40; in Sukhumi, 30; in Gagra, 33; in Gali, 85; in Poti 70 percent; and so on).

And this is the basic reason for the high level of pollution on the coastal region of the Black Sea with domestic waste water, and the high content of intestinal bacilli in the sea water, owing to which at times Minzdrav [Ministry of Health] authorities close certain sections of the beach.

Significant volumes of polluted waste water continues to pour into the basins of the Black Sea from major industrial enterprises, and there are frequent incidents of pollution of the coastal strip as a result of accidental spillage of petroleum products from both shore installations and vessels.

In this respect an especially severe situation is noted in the Batumi region. During the period from 1986-1988, Goskompriroda [State Environmental Protection Agency] authorities in Georgia have recorded 27 incidents of accidental spillage of petroleum products in the region of Batumi, for which the corresponding installations (the Batumi Central Petroleum Transshipment Base, the Batumi Oil Refinery, the Batumi Rail Freight Station, as well as various vessels) have received damage claims for violating water legislation to the tune of 900,000 rubles. Of this amount the Batumi Oil Refinery, charged for 19 accidental oil spills in which 13.6 tons of oil poured into the sea, was assessed 600,000 rubles.

No less harm is caused by the continuous (established) discharge into the sea of industrial waste waters from this enterprise. In 1988 the plant dumped into the Black Sea up to 13 million cubic meters of waste water. Even with normal operation of existing treatment installations (with purification of oil-bearing wastes of up to 20 mg/liter, as stipulated by the plan), every year over 250,000 tons of petroleum products pour into the sea, whereas in consideration of the maximum allowable concentration of petroleum products for sea water (0.05 mg/liter) and the volume of waste water, the plant has the right to dump no more than 1.25 tons per year.

The operation of a plant in the resort zone of Adzharia is creating an extremely unpleasant ecological situation, which is causing a great deal of public protest and complaints from our republic, from the local population, and from vacationers from all ends of the land and from abroad. At present, as is well-known, a decision has been taken—to halt work on reconstruction and expansion of the Batumi Petroleum Refinery, and to carry out only environmental protection measures there—introducing a system of water-supply recycling, elimination of direct dumping of industrial wastes into the Black Sea, and

sending them for treatment to the purification installation in Batumi. The question of constructing a new oil refinery in another region of the republic is being examined.

The danger of petroleum pollution consists of the fact that, being a toxic compound, petroleum has a negative effect on all groups of sea organisms: plankton, nekton and benthos. According to UN data, the harmful effects of oil pollution on biological resources is manifested in the direct destruction of sea organisms, from being coated with oil or ingesting it; in the poisoning of organisms as a result of contact with large doses or the long-term effects of lesser concentrations of the toxic components of oil; and in the destruction of sea flora food sources and the displacement of valuable varieties of fish.

In spite of the water conservation measures undertaken, the Chiaturi Manganese Production Association, the Zestafoni Iron Smelting Plant, the Kutaisi Automotive Plant, and the Poti Ship Repair and Construction Yard are still making a significant "contribution" to the pollution of the watershed, because their treatment installations are not purifying the waste water to the degree of the permissible norms for discharge.

The most promising solution to the problem for such projects is—transition to completely closed water supply systems, whereby an enterprise does not dump a single cubic meter of waste. Transition of major water-using projects to closed water supply systems will also permit carrying out the requirements proceeding from the resolution of the Georgian CP Central Committee and the republic Council of Ministers of 10 May 1988, "On Top Priority Measures for Improving the Use of Water Resources in the Republic," in accordance with which by 1990 industrial enterprises must reduce up to 20 percent of their net use of water per unit of production.

Many years of observation have shown that not only harmful discharge of polluted water, but also the state of the air basin of the region has a significant effect on the ecology of the Black Sea aquatorium.

Discharges of harmful particles into the atmosphere by industrial enterprises and motor vehicles along the coastal zone of the republic, precipitated onto the surface of the sea, significantly increase the Sea Coast.

According to data from the republic Goskomstat and the Georgian Hydrometeorology Administration, more than 130 industrial enterprises are situated in a 30-kilometer coastal zone in the Sukhumi-Batumi sector, and are discharging harmful elements into the atmosphere.

In addition, over 50,000 motor vehicles, including nearly 35,000 private cars, are operated on the region's main highway adjacent to the coastline. During the resort season this number increases significantly.

More than 342,000 tons of harmful elements discharged (22 percent of the discharges in the republic), falls to the

portion of gross discharges by industrial enterprises and motor transport in the region. At the same time, industrial enterprises in the region discharge more than 70,000 tons of harmful elements into the atmosphere every year.

Because the prevailing winds in the area blow in the direction of the sea, more than 50 percent of the harmful elements discharged into the atmosphere settle on the surface of the sea, leading to additional pollution of the water surface. This is also confirmed by chemical analysis of precipitation samples taken along the coastline in the Sukhumi-Batumi sector. A higher quantity of ions of the acidic groups were discovered in the precipitation, as well as other chemical elements, including ions of sulfates, chlorides, nitrates, hydrocarbonate of ammonia, nitrites, potassium, magnesium and others.

Observations of the pH factor in the water environment have shown that from 1985 through 1988 this indicator has shifted toward the acidic side—in the Batumi region by 4, and in the Sukhumi area by 10 percent.

At the present time the amount of pH in Sukhumi and Batumi is below the neutral state (7); it has moved toward the acidic side, and in the Batumi zone amounts to 6.37; and in the Sukhumi zone, 6.34 (the critical significance of 4 is, that it is dangerous for the environment).

In spite of measures taken to restore the health of the air basin, the general level of pollution of atmospheric air in such major resort zones of the republic as Sukhumi, Batumi and others, still remains high.

Thus, the index of atmospheric pollution (for four ingredients) in 1988 amounted to 4.25 for Sukhumi and 4.1 for Batumi, which is higher than the average national indicators. Taking into consideration also, that the PDK [Maximum Allowable Concentration (radio-biological)] for the resort zones is lower than the PDK for industrial centers (0.8 PDK), it becomes obvious that the level of atmospheric pollution in the resort zone of the Black Sea coast in the republic does not yet meet the ecological requirements of the present day.

Additional measures are required to restore the health of the air basin in the region.

We believe the most effective of them are:

- complete transition of the Tkvarchelskaya GRES to natural gas;—a ban on the use of hard (coal) and liquid (fuel oil) varieties of fuel in the resort area, and transition of all fuel-burning equipment in the resort zone to natural gas;—construction of bypass roads in Sukhumi, Poti, Kobuleti and elsewhere;—continuous and stable supply of non-leaded brands of gasoline to motor transport in the resort zone.

Carrying out the measures indicated will permit significant restoration of the health of the air basin in the

region, and will lower the overall level of pollution of the water surface in the aquatorium of the Black Sea coastal area in the republic.

At the same time it has long been necessary to define a sanitary protective zone along the entire shoreline of the Black Sea, in which industrial production would be forbidden, and other kinds of economic activity limited. The Black Sea is above all a resort and recreation zone; therefore, the development of the vacation industry must be given first place, and not industrial. Moreover, this question must be resolved at the national level, and even better, in conjunction with all the states bordering the Black Sea (Turkey, Rumania, Bulgaria); since local measures in the given situation will hardly provide an effect.

Recently, as already noted, the bacteriological pollution of the watersheds has intensified, in particular along the seacoast, right down to the observation of pathogenesis of microflora in certain sectors. The source of this pollution, apart from the influx of unpurified domestic wastes, is waste water from hospitals which have an infectious disease ward. Meanwhile, not one of them is equipped with the necessary installations for purifying waste water, and many do not even have primitive treatment facilities.

The most serious polluters of the watersheds are the agricultural enterprises—livestock and swine-raising complexes and farms, and poultry farms, which dump waste water in significant amounts into the watershed (on the whole for the republic, up to 6.5 million cubic meters per year), as well as manure and droppings.

At the present time, out of 55 livestock complexes in the republic, 34 lack treatment facilities, and at the other 21 they do not function at all. Out of 66 enterprises of the Gruzptitseprom [Georgian Poultry Industry] Production Association, 20 have no treatment facilities at all, and at 22 they are not functioning.

Every year, for example, the Kindgi poultry farm dumps into the River Tikhistskali, and through it into the Black Sea, up to 650,000 cubic meters of waste water, the concentration of pollutant substances of which exceeds the allowable limits by a factor of 5-15. The Ochamchiri poultry farm dumps into the River Mokva over 400,000 cubic meters of waste water and up to 300,000 tons of droppings per year.

An extremely unsatisfactory situation is also noted at the Tsageri, Zestafoni and Terzhola poultry farms; at the Abasha and Lanchkhuti swine-breeding complexes; at the Kobuleti, Kirtskhi and Khobi livestock complexes; and others.

One of the principal means of forestalling the pollution of the watershed when operating major stock complexes and poultry farms is the use of manure piles on sewage farms—which, on the one hand, prevents them from entering the surface and underground water; and on the other, is a resource for increasing the fertility of feed

crops. However, this work has still not been organized in the republic. The situation is aggravated by the fact that the complexes and poultry farms in the republic do not possess plots of land, as is the case in other regions of the country, and therefore they cannot make use of the manure and the droppings on their own farms as fertilizer.

Georgia is one of the republics where chemical means are used especially widely and the volume of their use is steadily increasing with every passing year. Whereas in 1960, 67,000 tons of mineral fertilizer were applied to the agricultural lands in the republic, expressed in terms of 100 percent nutrient elements, in 1988 251,200 tons were applied. Naturally, such progressive application of chemicals is cause for altogether understandable alarm.

Under these conditions, application of pesticides and mineral fertilizers must be done thoughtfully, from the point of view of the biology of the plants. However, in most situations, an altogether different picture is observed.

According to data from GruzUGM [unknown], soil contamination in the Abkhazskaya and Adzharskaya ASSR with chloro-organic preparations (DDT, its metabolite DDE, gamma and alpha isomers of hexachlorocyclohexane) are extremely high—in a number of cases it exceeds the maximum allowable concentration by a factor of 4-11.

It is noteworthy that, although the use of DDT has been banned for over 20 years now, the residual amount of this pesticide, by virtue of its stability and migrational ability, is observed in amounts much higher than the maximum allowable, not only in the soil and agricultural products, but in the human organism as well. A significant amount of this preparation is observed every year in milk, eggs and meat products, in which even an insignificant amount of DDT is unacceptable. Moreover, DDT has been observed even in the milk of breast-feeding mothers (in Shuakhevskiy Rayon).

At present the DDT replacement, DDT-HCCH [DDT-Hexachlorocyclohexane], is widely used in agriculture, the residuals of which are also observed in amounts greatly exceeding the allowable in agricultural products; while in terms of stability and ability to migrate in the environment this preparation is somewhat below DDT.

Of the practical measures directed toward preventing the harmful effects of pesticides on the state of the water sources, an important place must be given to work on selection of new preparations which have selective effects on the pests and at the same time are less toxic and stable. It is necessary to expand the work on creating biological methods of fighting pests and the most rational means of combining them with chemical methods. Here our scientific-research organizations must have the deciding vote.

At the present time new treatment methods are being worked out in the country, using absorbent materials

which have won recognition abroad as well. Baltic scientists are working on the question of treatment of liquid manure-bearing waste water—which is a severe problem for our republic as well; and there are interesting developments on treatment of waste water from galvanic production.

The article, "Baykalskiy Patrol" [Baykal Patrol], which appeared in the 23 March 1988 edition of PRAVDA, is worthy of note. The article reports that the Laboratory for Monitoring the Natural Environment and Climate (LAM) of Goskomgidromet [State Hydrometeorology Committee] and the USSR Academy of Sciences have developed a scientifically-based observation system for Lake Baykal and the entire region, have begun to take regular measurements both in the water and in the ambient air, and have analyzed contaminated soils. The Limnology Institute of the USSR Academy of Sciences and the Institute of Water Toxicology of USSR Minlesbumprom [Ministry of the Timber, Pulp-and-Paper and Wood-Working Industry] have taken up the study of the reaction of water organisms. Thus they have been able to record the extent of change of the chemical make-up of water and changes in microbiological and hydrobiological indicators. The Institute of Applied Geophysics (IPG) and LAM have established the role of airborne pollutants, including those from sources located a significant distance from the lake.

Based on the data from monitoring, priorities have been determined for implementing nature-conservation measures.

It would be well to conduct work on the Black Sea as well, after concluding a special agreement with Bulgaria, Turkey, Rumania or other interested states.

Thus, many measures have been and are being taken in the republic on the problem of forestalling the pollution of the Black Sea basin; but for an effective and economically optimal solution of this global problem it is necessary to develop a general program for developing a complex of water conservation measures, in consideration of the future, which would ensure satisfying the needs of a developing national economy and growing population in the region for water sources of normative quality.

Scientific-technical progress has been and will remain the driving force and main source of changes in society.

Today it has become the fashion to complain about technology as a result of its negative effects on the environment, for which there is some justification. Even preliminary estimates indicate that at the present time one-fifth of industrial labor productivity must be devoted for ten years to eliminate the pernicious effects of industrial production. However, we, nevertheless, must not underestimate the significance and role of scientific-technical progress in our lives.

Consequences to the natural environment must always be taken into consideration, but they must not pass

sentence on technical development. It is namely technical progress that will define the problems with which we must deal in the future. In actuality, the conditions for applying equipment and technology may change, but their importance cannot be denied.

The rational introduction of ever greater portions of natural resources and the scientific potential of our republic to production increases our confidence in the fact that we will be able to effectively control this process and promote the satisfaction of society's needs.

Estonian Views Tallinn Baltic Ecology Conference
90WN0192B Tallinn SOVETSKAYA ESTONIYA
in Russian 27 Jun 90 p 2

[Interview with Doctor of Geological-Minerological Sciences Anto Raukas by G. Golub: "Global Disasters in the Mirror of the Republic"]

[Text] Yesterday in Tallinn, a conference opened for the leaders and specialists of the academies of sciences of the three Baltic Republics and the Swedish Royal Academy of Sciences devoted to the problems of ecology. The Estonian delegation included several academicians and leading specialists in the area of geology, physics and so forth. One of them was Academician and Doctor of Geological-Minerological Sciences Anto Raukas and he answered questions posed by our correspondent.

[Golub] Anto Viktorovich, judging from the membership of the conference participants, they were brought together by a common interest in the ecology of the Baltic Sea?

[Raukas] Yes, this is a great pain and concern for all eight states located along the coast of the Baltic. And there are more than enough justifications for alarm. Judge for yourself.

The Baltic comprises 1/1,000 of the world ocean in terms of area and 1/70,000 in terms of volume. Here 15 percent of the product produced in the world comes from this region. And the region is overpopulated. If it were possible to evenly spread people out around the world, then 100,000 persons should live here. But 150 million do. For this reason, the Baltic has the highest load in comparison with the other seas, the pollution level is higher and, respectively, the responsibility of man.

The capitalist nations have long understood this and are taking measures to protect the Baltic Sea. Moreover, they have realized that it is easier to provide subsidies to the Eastern countries than to wait for them to put themselves in order.

[Golub] This explains the involvement of the Swedish Royal Academy of Sciences in the conference?

[Raukas] We have old contacts with Swedish scientists and there is even a common program. But at present,

having established a Baltic Common Market, it is essential to think about cooperation.

[Golub] At the conference you gave the main report on the ecological situation in Estonia. Could you briefly describe its main areas?

[Raukas] Let me begin by saying that the history of protecting nature in Estonia goes back to the year 1910, when for the first time in Russia the small Estonian island of Vayka was put under protection for the sake of protecting birds. By 1940, Estonia had 47 nature-conservation territories. In 1957, the republic government passed the nation's first law on the protection of nature, and in 1971, the Lakhemaaskiy National Park was organized (again the first in the nation). Presently, 7 percent of the republic territory is a nature conservation zone.

[Golub] Nevertheless, we, seemingly, have not been very successful in the real protection of nature.

[Raukas] Yes, the current situation can be described in a word, a crisis. And we have approached it with giant strides in producing this crisis. This is confirmed by the following data.

In the postwar years, the republic population grew by 1.4-fold and the number of manual and white-collar workers by 3.8-fold. Here the production of industrial product rose by 42-fold, mineral resources by 15-fold and electricity by 100-fold.

[Golub] Previously, the same figures were given in amazement: just look at the pace!...

[Raukas] Yes, there was a payment for this pace and 8 percent of the territory where shale and peat were mined was completely destroyed with the historical natural landscape. Each year, our enterprises released around 4,000 tons of harmful ingredients into the atmosphere. Around the Narva power plants, if there were no winds, within a radius of 40 km each year some 32 tons of dust, soot and so forth precipitated out per square kilometer. In real life, a portion of this "good" was carried off by the wind to other regions.

[Golub] Including to the opposite coast of the gulf. I remember many years ago an engineer from the Baltic GRES [State Regional Electric Power Plant] joked bitterly in pointing to the black trail of smoke emerging from the smokestacks of the plant: "Well, we are sending free mineral fertilizers by aid. And in response there are only complaints and accusations of polluting the environment."

[Raukas] Yes, no one was thankful for such "gifts." For completeness of the picture, let me give data on the water. Each year some 2,200,000,000 m³ of water flow into the river and lakes of Estonia. Of this amount, 52 percent is treated in keeping with the standards, 37 percent is partially and 11 percent not at all. Let me point out that such components as phosphorous and nitrogen are not removed at all in treatment. One of the

most flagrant examples is the Purtse River in the shale basin where the water has a phenol content which exceeds the standard by 500-fold.

Nor can we hope that we will be saved by the underground waters as 45 percent of these is already polluted or is being polluted.

[Golub] And then all these, to put it mildly, polluted rivers and streams empty into the Baltic....

[Raukas] As a result, we have the following picture: a liter of sea water contains 500,000 micrograms of nitrogen, 49,900 of phosphorous, 9,000 of zinc, 4,000 of copper, 35,000 of oil products and so forth.

[Golub] Terrifying figures.

[Raukas] Very. I have been using them for a long time in my work, but up until now they could not be said outloud and particularly at an international conference. For so long we have been forced to pretend that everything was fine. Now, the coming generations will have to pay for the years of the thoughtless attitude toward nature. It is no secret that in the Northeast, infant morbidity and mortality are higher. According to the medical data, in Kokhtla-Yarve people suffer 2.5-fold more from bronchitis and 2.7-fold more from hypertension than in Rakvere.

[Golub] But it cannot be said that we did not pay any attention to the questions of protecting the environment. There was and is a system of control and so-called MPC or maximum permissible concentrations were set for various substances.

[Raukas] Correct. There were standards and there were good laws. Only they were not carried out. The questions of protecting the environment were secondary and merely impeded the fulfillment and overfulfillment of the plan.

[Golub] Which of the ecological problems do you consider most crucial for Estonia?

[Raukas] I can list them: the mining and processing of minerals, power, the chemical industry, military installations, agricultural pollution. And common to all these sectors is the problem of a shortage of specialists.

[Golub] Ecologists, biologists?

[Raukas] No, intelligent engineers. Our ecologists can state and describe the existing picture. For example, with the aid of lichens they can determine the degree of pollution. But they do not provide engineer recommendations and they cannot say how to get rid of this pollution. For this reason, we must welcome the initiative of the Tallinn Technical University where upon a proposal of Academician Veyderma they have decided to incorporate on all faculties a new course for the principles of protecting nature. It is also essential to use the aid of the developed countries.

[Golub] What do you have in mind?

[Raukas] A specific example. Under the aegis of UNESCO there is the Baltic Sea Project, a youth movement which involves the schoolchildren of the Baltic countries, including Estonia. This is the Azeriskaya Secondary School, the Pyarnu Fourth, the Kadrinaskaya, Kundaskaya and others. Among them are even primary schools such as the schools at Vormsi and at Kikkonnina. So there is a chance that the future generation will be more literate in ecological terms.

[Golub] Anto Viktorovich, from our conversation it emerges that we are to blame for our own disasters. This, of course, is true. Although it is no secret that the process of polluting goes on everywhere, including in the developed countries. There are global problems.

[Raukas] Undoubtedly. There is the hothouse effect, the acid rains, the ozone hole which concern all inhabitants of the earth. But each does his bit.

It is possible to speak of global problems. Ten days ago I was at a cement plant in Finland where it is cleaner than it is in Estonia in the center of Tallinn. And I remembered our Kunda. What can we say?...

[Golub] In conclusion, several words about the questions of the discussions and debates at this conference.

[Raukas] Our work with Swedish scientists is in the following areas: the elaboration of alternate (wind-powered) energy, protection of the air and water, and legal aspects of the protection of the environment. I feel that these questions will be common for all the conference participants.

Pollution From USSR Blamed for Lapland Deforestation

90WN0212A Helsinki HELSINGIN SANOMAT
in Finnish 15 Jul 90 pp B1-2

[Article by Liisa Vanninen: "Eastern Lapland's Lost Forest"—first paragraph is HELSINGIN SANOMAT introduction]

[Text] The factories on the Kola Peninsula are dumping more pollution on Eastern Lapland than was thought to be the case up to now. The northern forest is being lost, and people's anxiety is constantly growing.

The dead pine forest was a disconsolate sight. Tens and hundreds of gray trunks stretched out under the bare branches. Some of the trunks had let their bark fall to the ground. There were no needles, and, where there happened to be any, they had dried up into twisted yellow or brown objects. Last summer woodpeckers nested in the forest; they do not nest there anymore.

Lapland's best known pine forest is at Naruska near Salla. It is five km to the Soviet border and 55 km to the iron mine and concentration plant in the town of Kovdor on the other side of the border. The dead forest is in

Northern Salla, a God-forsaken wilderness. For decades it was allowed to renew itself at its own pace; it was only in the 1920's, during the Pork Revolt, that it was thinned out.

On the map, the three-hectare area bears the ominous name "Rikkilehto" [sulphur grove]. The young, 60-year-old pine forest ought to be one of the cleanest in Finland and Northern Europe. Now, Naruska is believed to be only the beginning, the first forest in Lapland to be destroyed by sulphur discharges coming from Kola.

In the fall of 1987 forest owners discovered a 10-hectare forest at Satsi, near Salla, that had died of pine sapling cancer.

In the spring of last year sapling cancer had killed or damaged 150 hectares of forest around Salla.

This spring 40,000 hectares of forest destroyed by sapling cancer were discovered in the area administered by the Northeast Finland Forest Board alone. The destroyed areas were not new, but only just discovered when logging planners were making the rounds of the forests.

It is now known that sapling cancer has already gained a foothold in the neighborhood of three towns close to the border: Salla, Savukoski, and Inari.

The destruction of the forests around Salla has been spreading for nearly three years now. After two favorable growing seasons, they waited to see whether the damaged areas would begin to recover. They are only getting worse. The forest owners and local residents watched what was happening to their forests and wondered why nothing was being done. Now, they are not only wondering; they are demanding that the government take quick action.

Will Agreement Endorse Destruction?

District forester Pertti Tuomi of the Upper Kemi District believes that at least two years of precious time have been lost in dawdling. "Every day that passes now is one too many. Something can still be saved if the advance of the destruction is stopped immediately."

"Soon we'll have to be evacuated from here," Matti Klemetti, the chief forester of the Northeast Finland District Forest Board, feared. Klemetti's board has just issued new forestry recommendations in which there is provision for taking into consideration pollutant discharges in the damaged areas next time. In them they recommend that the land no longer be cultivated.

They consider restoration of the forests destroyed by pollutants to be a very difficult proposition because they have no experience and know-how of the work to be done. While the most vigorous forest does not grow by itself, it grows even more poorly when cultivated. They have attempted to restore the less severely damaged areas to health by cutting down the unhealthy trees.

Klemetti and Tuomi are certain that only prompt reductions in pollutant discharges on Kola can save Lapland's forests: The volume of discharges must be reduced by 95 percent. In their opinion, we Finns should pay for the technology for cleaning up Kola's smelteries if the alternative is an Eastern Lapland that is dying because of its forests.

No more so than we Finns do the Soviets have a clear idea of how much pollution is discharged by Kola's factories. Sulphur dioxide discharges are estimated to amount to 570,000-700,000 tons a year, whereas the total amount of sulphur that falls on Finland is less than 300,000 tons. The worst polluters on Kola are the nickel smelteries in Montsegorsk and Petsamo.

Last fall Finland and the Soviet Union concluded an official agreement that promises to cut by 1995 the volume of discharges to half of what it is now. In the opinion of many people, the agreement will merely endorse the destruction.

Tuomi, the district forester for the forest around Salla that has been destroyed, sharply criticized Finnish environmental policy. "Decisionmakers' time and energy have been wasted on the waterfalls: Kessi, Murhijarvi, and Talaskangas. Protection of the original natural environment is important, but the real time bomb is elsewhere—it lies in aerial pollution and in these forests."

Other voices can also be heard in Salla. Fearing the loss of tourists and the reputation of the locality, some travel agents and union representatives are demanding that nothing be said about the dying of the forests.

"It's sheer madness to stick one's head in the sand in connection with as serious a matter as this. Now, at least, the effect produced by aerial pollutants is being recognized. A year ago, it wasn't even acknowledged." Tuomi believes that they already knew years ago at the Meteorological Institute what was happening at Salla, but they maintained silence on the fallout.

Forest owners at Salla have exasperatedly asked for additional studies and funding to save their forests. "They [the authorities] just reassure us. So, we should just stand here twiddling our thumbs while the forest dies around us," forest owner Heikki Vaarala said.

Salla residents are not all that pessimistic about the situation. A few kilometers away from Rikkilehto, there is a station for measuring sulphur dioxide levels that the local forest owners procured a year ago. They say that it is the highest achievement of a civilized nation. When the Meteorological Institute did not begin to provide money for air measurements, the forest owners collected the money themselves and donated the metering station to the University of Oulu for its use. Once the residents of Salla got their metering equipment, the Meteorological Institute also provided Varrio, 60 km from Salla, with a metering station.

The latest results reveal that there is considerably more sulphur dioxide in the air at Salla than was supposed, and that the air contains the same amount of sulphur dioxide as in Central Europe. According to Assistant Professor Satu Huttunen, who analyzed the results at the University of Oulu, it was assumed that they would exceed the normal readings for a year in about two months' time. They actually did exceed them in over four months' time, and the peak readings rose to those usual in Finnish cities.

Do Pollutants Contribute to Tree Cancer?

The metering device at Naruska has been measuring sulphur dioxide levels at 10-day intervals. In similar measurements taken, for example, by Bayer in the Black Forest in the Federal Republic of Germany, peak readings were obtained that were half as high as the peak figures obtained at Naruska. Sulphur dioxide fallout at Salla was also clearly greater than fallout of the same substance at, for example, Oulanka, near Kuusamo, and at Kuhmo; that is, the volume of sulphur dioxide fallout in the east increases as it moves from the south to the north.

Salla always gets its high surges of sulphur [fallout] with air currents from the northeast. Northeasterly air currents reach Finland during about four months of the year.

It is the high fallout peaks that are especially dangerous for evergreens, more dangerous than constant, even fallout. When pollutants come down in sudden showers

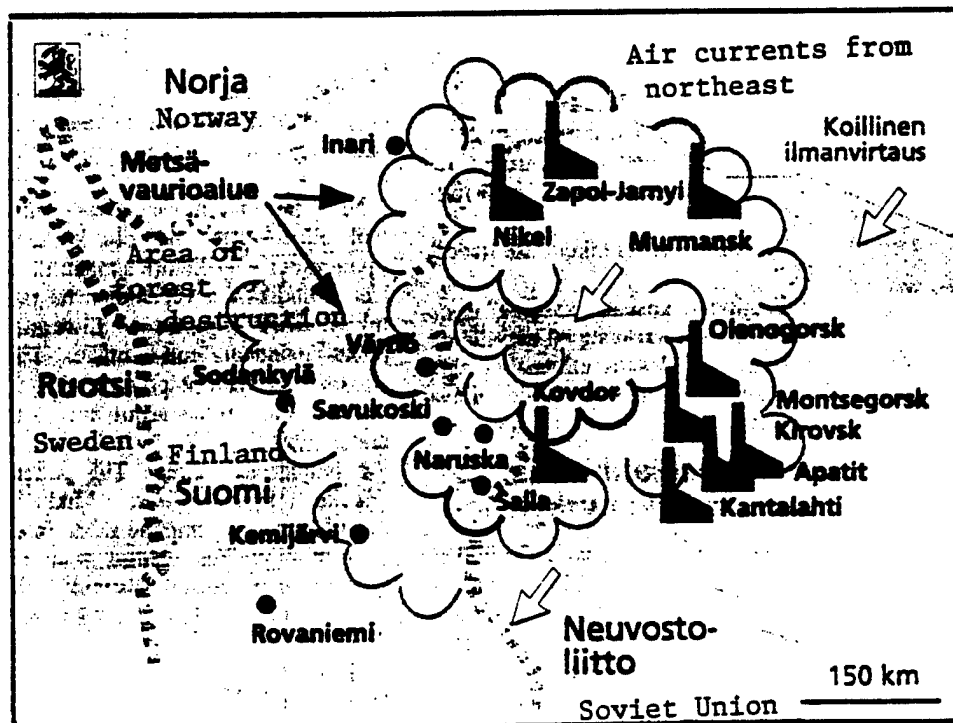
sporadically, the tree receives a shock it never adjusts to. When, to boot, it lives under difficult conditions—or nearly on the fringes of the living environment, as in Lapland—it is prone to sapling cancer over the years. Cancer attacks the lower branches of the tree first and moves up the trunk toward the crown.

Sapling cancer is usually regarded as a disease found only in sapling forests and damp areas, but now it is destroying entire forests in the north. Nor was sapling cancer found in high areas before, either, but now it has killed off a 300-year-old forest covering an entire arctic hill. This was also the first time sapling cancer was found on northern firs.

According to Huttunen, aerial pollutants often cause the disease to change its mode of life.

The researchers have more than enough work to keep them busy. According to Huttunen, now they have to demonstrate why pine sapling cancer thrives in a polluted atmosphere.

In Eastern Lapland, especially at Salla and Savukoski, the soil also contributes to the death of the forests. It is more sensitive in its reaction to acid rain than the soil elsewhere in Finland. Because acid rain releases aluminum, in particular, from the soil, large amounts of it are found in the destroyed areas. And because there are otherwise so few nutrients in poor soil, the percentage of soluble aluminum grows to become disproportionately high, and the tree does not get other nutrients.



Satu Huttunen believes that not all the problems produced by pollutants along the Northeast Lapland border—at Salla, Savukoski, and Inari—have yet surfaced. "On the basis of the current results of our research, too, we know that the problems in these communities are serious and that they will certainly get worse during the next 10 years. We cannot predict how far and wide the destruction will extend into Central Lapland."

According to Huttunen, to determine the extent of all the destruction, research and documentation are in particular needed on concealed damage. They are needed, too, because Finland cannot, for example, demand anything of the Soviet Union without solid proof. If there is a lot of evidence, we Finns can even demand that the factories on Kola be shut down.

Among others, Soviet Environment Minister Nikolay Vorontsov has said that he has to be given solid proof that the soil or waterways have become acidified or that there are signs of concealed damage in the natural environment.

What Is Wrong in Lapland?

A detailed determination of the effects of Kola pollutant discharges will be obtained during the next few years through an extensive study of the damage to forests in Eastern Lapland. It will be conducted by the Forest Research Institute, but scientists from various institutes and universities will be participating in it. Scientists from the Kola Academy of Science on the Soviet side of the border will also participate in it.

Sulphur Dioxide Content of Air at Salla, 1989-90



Normal reading was exceeded in measurements over a period of more than four months.

Key:

1. Micrograms per cubic meter
2. Normal reading
3. June
4. July
5. August
6. September
7. October
8. November
9. December
10. January
11. February
12. March
13. April
14. May
15. June

Over a hundred research points are to be established in Lapland, and nearly everything in the forest that can be, from moss to trees subjected to stress, will be analyzed.

The most important question is: All things considered, what is wrong in Lapland?

The research began in a niggardly way. At first, the state did not want to come up with the 2 or 3 million markkas that had been promised. Now, the Soviets have not received enough money. Test sites have been set up on Kola, but they cannot conduct studies to the extent it was hoped they would in Finland. All of the studies planned for this summer will have to wait until next summer. "But the scientists are enthusiastic. Environmental research has been approved for the first time there, and this is something new for the scientists," Huttunen said.

Satu Huttunen, who has been studying aerial pollutants and the forests for 20 years, feels that profound contradictions exist in the way we regard our forests. "The Finnish economy depends on the forests, but this is completely forgotten in connection with, for example, environmental research. It is not yet understood how much the fate of the forests is rocking Finland's forest economy. Considerably less money is made available for forest research than in, for example, Central Europe, in spite of the fact that lumber is the mainstay of our economy."

Huttunen reminded us of a study made by the Forest Research Institute this spring in which it was maintained that Finland's forests are growing at top speed and that environment pollutants have only accelerated tree growth. "It really makes you angry when pollutant researchers are viewed as some sort of idiots. As though we didn't know anything about how forests grow."

"The surface area covered by forests has increased here in Finland, and forest yield per cubic meter has grown because of more efficient management. In agriculture, too, we know that quantity does not mean quality. Forest growth has diminished in all barren forest areas."

Finns Cite Safety in Refusal To Service Soviet Nuclear Ship

PM3008150190 Moscow SOVETSKAYA ROSSIYA in Russian 29 Aug 90 Second Edition p 5

[Unattributed report: "Finland: Maintenance Refused"]

[Text] The Finnish Ministry of Trade and Industry has not allowed preventive maintenance work to be carried out on the Soviet nuclear-powered icebreaker Vaygach at the Vuosaari Shipyard, which belongs to the Finnish shipbuilding firm Masa Yards. This was reported in the newspaper KANSAN UUTiset.

The nuclear-powered icebreaker Vaygach, like the Taymir before it, was built at the shipyard of Finland's Wartsila Meriteollisuus Company and handed over to

the Soviet customer in the spring of last year. The nuclear reactors were later fitted on both icebreakers in Leningrad.

As Sakari Immonen, senior inspector of the ministry's power industry department, stressed in the newspaper, the decision taken by the Finnish authorities is bound up with the fact that the nuclear reactor protection equipment on the Soviet icebreaker does not meet the radiation safety requirements laid down by Finnish legislation. These requirements, the inspector explained, coincide in principle with those currently operating at Finnish nuclear electric power stations.

British Identify Polluting Projects in India

90WD0565 Bombay THE TIMES OF INDIA in English 6 Jul 90 p 7

[Text] London, 5 July (UNI)—Expensive aid projects promoted by Britain have caused widespread pollution in India, the British Parliament's public accounts committee has said in a report released here yesterday.

Among projects the all-party committee identifies as having caused environmental damage are the open-cast mining at Amlohri, Gosunda dam, Hindustan Smelter and the Indo-British Fertiliser one.

The report—a scrutiny of the 1 billion pounds worth of British aid to India in the past decade—comes after charges by the opposition Labour Party that Britain was exporting acid rain to India.

Labour overseas aid spokeswoman Ms Ann Clwyd said a trade deal between the Prime Minister, Mr Margaret Thatcher, and the late Indira Gandhi to promote aid for the Rihand coal-fired power station was creating acid rain in India. About the mines at Amlohri, the report said there were "Severe pollution hazards from dust and gas, devastation of the landscape and spontaneous surface fires."

It said that though the Overseas Development Administration (ODA) had taken steps to mitigate environmental or social problems, "the remedy had proved to be outside their control."

The report by the all-party Commons Committee charged that unsafe pesticides and fertilisers were being used in another project, the Indo-British fertiliser.

The committee also protested at the lax health and safety standards at the Hindustan Zinc Smelter project and at the displacement of 3,500 villagers by the Gosunda dam.

"We note the evidence that projects have had an immediate and positive impact on development, but we are concerned that the administration does not have a comprehensive view of the broader and longer term impact of the projects they support," the committee said.

The report also noted that there were fears about the impact of eucalyptus monoculture in the Karnataka social forestry project, but quoted the ODA as saying the results of a research suggested such environmental concerns were "largely unfounded" and that there was no scientific evidence the project had caused soil erosion.

The ODA said that it had told the project authority in the Indo-British fertiliser case that it would not subsidise an unsafe pesticide "but they could not stop Indian farmers using it."

The ODA also said compensation had been offered later to villagers displaced by the Gosunda dam project.

SOUTH AFRICA

Environment Minister Says Nation Not To Accept 'Dangerous Waste'*MB2508095490 Johannesburg Domestic Service in English 0900 GMT 25 Aug 90*

[Text] The minister of environment affairs and of water affairs, Mr. Gert Kotze, says he will not allow South Africa to become the dumping ground for the world's dangerous waste.

Speaking at the National Party's regional conference in Johannesburg, Mr. Kotze said it was strongly suspected that dangerous waste was getting into South Africa illegally.

He warned that strong action would be taken against those who broke the law, and called on South Africa's neighbors not to yield to short-term monetary gain by entering into agreements with dealers in waste.

Cabinet Approves Toxic Waste Importation Ban*MB2708124990 Johannesburg THE STAR in English 27 Aug 90 p 2*

[Report by John Yeld: "Minister Imposes Ban on Importation of Toxic Waste"]

[Text] No hazardous waste will be allowed to be imported into South Africa, says Minister of Environment Affairs Gert Kotze.

He would not permit South Africa to become the world's "dumping ground", and the Cabinet had approved the ban.

The move, which follows a major controversy last year over proposals for a R[and]400 million toxic waste plant near Alexander Bay in the northern Cape, has been welcomed by conservationists.

Speaking at a National Party regional conference in Johannesburg at the weekend, Mr. Kotze also revealed there was a strong suspicion that hazardous waste was being smuggled into South Africa.

It is unfortunate that the environment paid the price for development and progress, and one of the by-products of such development was the generation of all types of waste.

This was one of the reasons his department had asked the CSIR's [Council for Scientific and Industrial Research] Foundation for Research Development to investigate the issue fully.

He had discussed the issue of hazardous waste during his recent visit to Europe.

"These discussions reaffirmed my fears about the seriousness of the environmental dilemma that could develop.

"I have therefore decided that South Africa will under no circumstances allow other countries to export their hazardous waste to South Africa.

"This decision implies a total ban. No hazardous waste may therefore be imported—not for the purpose of treatment nor for dumping.

"I know, there are numerous countries that look with longing eyes to, among others, South Africa, in order to dispose of their waste."

Mr. Kotze's announcement has been welcomed by the Wildlife Society.

"The consensus is that toxic waste should be treated as close as possible to where it was produced," said the society's director of conservation, Keith Cooper.

Accidents did happen, and a shipwreck involving a vessel carrying waste could be disastrous.

Earthlife Africa, which has been instrumental in exposing illegal toxic waste dumping in Natal, said it was absolutely opposed to the cross-border transportation of chemical waste—and pleased with Mr. Kotze's announcement.

But it also wanted clarity on a number of points, particularly Mr. Kotze's definition of "hazardous waste".

"Does this include chemical waste that leaves other countries and enters our country classified by South African Customs as 'raw materials'?"

Employees Exposed to Radioactivity at Sasolburg Plant*MB2808094390 Johannesburg SAPA in English 0843 GMT 28 Aug 90*

[Text] Pretoria Aug 28 SAPA—A number of employees at the SASOL [South African Coal, Oil and Gas Corporation] One plant in Sasolburg are under constant medical observation after possibly being exposed to radioactivity.

This was confirmed on Tuesday [28 Aug] by Mr. Jan Krynauw, media manager of SASOL in Johannesburg.

According to Mr. Krynauw, the incident happened about two weeks ago when an external contractor accidentally left an isotope on site at the SASOL One plant.

He said initially it was uncertain exactly how many people had been exposed to the radioactive source, and that a total of 24 employees were tested.

"However, preliminary indications are that six employees have been exposed and would possibly suffer after-effects", he said.

Mr. Krynauw said the external contractor was called in to conduct tests at the plant—which could not be done by SASOL—when he accidentally left the isotope on the site.

Mr. Krynauw said it was not yet certain what the extent of the effect of the exposure would be.

Minister on Conservation, Demands on Environment, Fishing Resources

*MB3008141490 Johannesburg SAPA in English
1317 GMT 30 Aug 90*

[Text] Durban Aug 30 SAPA—The biggest environmental conservation challenge facing South Africa was how to balance the ideals and expectations of the First World with the realities and needs of the Third World, said Environmental and Water Affairs Minister Mr. Gert Kotze.

"Every inhabitant of the republic is entitled to live, work, and relax in a safe, productive, healthy and aesthetically and culturally acceptable environment," Mr. Kotze told the Natal National Party Congress on Thursday.

He said the concept of sustainable development was linked to this goal.

"Perhaps I should point out that development is only sustainable when it meets the needs and aspirations of the present generation without compromising the ability of future generations to meet theirs."

Mr. Kotze emphasized the importance of South Africa's marine resources not only for its aesthetic and recreational value but also as a fishing industry which generates employment for 27,000 people and foreign exchange.

"Probably the biggest single challenge facing us in applying our environmental conservation policy is to balance the ideals and expectations of the First World with the realities and needs of the Third World."

The pressure on South Africa's marine resources was intensified by 300,000 rock and beach anglers, some 170,000 boat anglers and about 58,000 private divers and fish hunters.

"The sea is generous and its harvest bountiful, but it is not unlimited."

Mr. Kotze said South Africa played a leading role in the control of marine resources and that its determination of allowable catches was among the best in the world.

He therefore took strong objection to the impression conveyed in certain media reports that his ministry had adopted a "slack" attitude towards the use of gill nets.

"Quite the opposite is the case. South Africa is at the spearhead of an international attempt to stop this unacceptable and destructive fishing method.

"Vessels with gill nets, or gill-netted fish on board, are not welcome in South African waters. No permits to do so, will, as long as I can help it, ever be issued," Mr. Kotze said.

Liaoning Adds Environmental Protection to Annual Plan

90P30074A Shenyang *LIAONING RIBAO* in Chinese
9 Jul 90 p 1

[Summary] The Liaoning provincial planning conference has issued an environmental protection plan that brings environmental protection into line with the annual provincial economic and social development plan. Liaoning is one of the four provinces (municipalities) in China to have issued an environmental protection plan.

Although environmental protection is a basic national policy, the provincial economic planning commission did not put its planning and management on the proper course until 1984. In 1987, the Liaoning Economic Planning Commission and Liaoning Environmental Protection Bureau jointly issued the first "Liaoning Provincial and City Environmental Quality Control Plan." In 1988 and 1989, 8.14 million trees were planted, green acreage per capita increased from 2.9 to 3.3 square meters, and 17,782 buildings in violation of regulations were removed. Public restrooms, both new and renovated, numbered 2,246. During investment planning, emphasis was placed on such key construction items as water supply, greening, drainage, sewage, and public transportation works.

INTER-ASIAN

Papua New Guinea, Solomon Islands To Protect Rain Forests

OW2608065290 Beijing XINHUA in English
0612 GMT 26 Aug 90

[Text] Wellington, August 26 (XINHUA)—Papua New Guinea (PNG) and the Solomon Islands are moving to control logging of rainforests in the two South Pacific island countries.

"The move is part of an international campaign to save the rainforest, in unique deals with international environmental groups, foreign government and banking organizations," according to the latest issue of the Fiji-based monthly ISLANDS BUSINESS.

A three-part plan for the protection of rainforests in PNG will be funded by seven countries including New Zealand. It will see the establishment of world heritage areas and other parks, the banning for two years of issuing timber permits, and a complete reform of forestry administration aimed at controlling timber companies.

The Solomon Islands Government is working in association with New Zealand environmental groups to designate areas of rainforest for protection. In Solomons, 86 percent of its land is covered by rainforest, but it is rapidly dwindling. It is believed that unless action is taken, half of the Solomons rainforests will be destroyed within 15 years.

THAILAND

Overpopulation, Pollution in Bangkok Reviewed

90WN0244 Bangkok BANGKOK POST in English
11 Jul 90 p 29

[Article by Wasant Techawongtham. First paragraph is introduction]

[Excerpts] Today is World Population Day Bangkok, with more than 10 million people, is facing a horde of problems that threaten its environment and the health of its citizens. Officials have to respond to them. But will they? Can they?

Bangkok had a population of 5.8 million in 1989.

That is an official figure gleaned from the list of household registrations. But anyone who has spent even a few days in Bangkok could not help but feel that the figure is grossly understated, and he would be right.

In its 1989 survey, the National Statistical Office reported that up to 30 per cent of Bangkok's population was not registered. A rough calculation would then put the total population at 8.3 million.

The same survey found that 23 per cent of the school-age population in Nonthaburi and 19 per cent of the provincial workforce commute to Bangkok each day. If these numbers are generalised for other vicinities around Bangkok, the total number of people travelling the city streets at any one time might well exceed 10 million.

Now, a year later, a population of 11 or even 12 million in Bangkok may not be far from the truth.

What does it all mean to the administration of the city, to its environment, and to its residents' quality of life?

With its 10-million-plus population, Bangkok has become one of the world's largest cities. The demand for public services and infrastructure has pushed the city government's ability to provide these services to the limit. The uncontrollable, one-way migration from the rural areas adds complications to official efforts.

Evidence of urban blight and strain are everywhere. What were once clean canals have become open sewers for household and industrial waste. So has the majestic Chao Phya; the Lord of Rivers is expected to become unsuitable to sustain life in the near future.

But the uncontrolled growth, the lack of city planning, and the undisciplined driving habits of Bangkok motorists have all also contributed to the problem. The growing population only worsens the already intolerable situation.

It is doubtful that the jams would cease to exist if all these problems were solved. The general wisdom is that the number of cars would simply multiply.

According to available statistics, between 1980 and 1988, the number of private cars in Bangkok increased nearly three-fold from 358,759 to 971,129. And as the economic boom has generated a huge cash flow among many city residents, the demand for private cars is running higher than ever.

Trailing closely behind this over-abundance of vehicles are air and noise pollution. In research for the March 1990 issue of FEATURE MAGAZINE, a team of researchers from Chulalongkorn and Mahidol universities measured the level of noise and of carbon monoxide at 30 sites throughout Bangkok.

The team found that the noise level at all sites was above standard, over 80 decibels. All locations were also found to have high levels of carbon monoxide, five at the dangerous level.

Measuring the amount of oxygen in the Chao Phya, the team found that the water generally contained less oxygen than was acceptable, averaging less than two milligrammes in a litre of water. The accepted standard is seven milligrammes or more.

The findings come as no surprise to Bangkokians, who do not need any statistics to tell them what they breathe, hear, and encounter every day.

Another source of pollution, which is both an eyesore and a health hazard, is the amount of refuse generated by the Bangkok population.

According to the National Environment Board 1989 statistics, Bangkok residents generate about 4.8 million kilogrammes each day, averaging to 0.9 kilos for each resident.

One 84 per cent of the population or 5.7 million people receive the garbage collection service. There are 732 refuse trucks, each truck serving 76,000 people. These trucks collect only 4.2 million kilos of trash a day, leaving nearly 600,000 kilos uncollected.

Ten per cent of the collected refuse is processed into fertilisers. The remainder goes to landfills.

The refuse left in landfills each year amounts to more than 1,700 million kilos or 5.6 million cubic metres. If you pile it up to the height of a 30-storey building, the size of the Bangkok Bank headquarters, you will get 66 such buildings of trash. Quite a sight, not to mention the smell.

And where does the uncollected refuse go?

The answer, as any Bangkokian can easily guess, lies in the polluted klongs, streams, the Chao Phya River, empty plots of land throughout the city, and on roadsides. Each year, it amounts to more than 200 million kilos.

INTRABLOC

Bulgarian City Polluted Again by Romanian Plants

*AU2408143590 Sofia DUMA in Bulgarian 22 Aug 90
p 2*

[Text] Ruse, 21 August (DUMA correspondent)—During the past 24 hours the air of this Danube city has again been systematically polluted with gaseous discharges from the Romanian plants in Giurgiu. The special laboratory of the regional environmental protection inspectorate took measurements over a three-hour period at four points in the town. It was established that chlorine pollution was present, but in minimal amounts, considerably below the maximum permissible levels.

The graph of gaseous pollution with chlorine ions is more alarming. All four measuring stations in the town discovered amounts in excess of the permissible levels, ranging from 0.3 to 0.386 milligrams per cubic meter, while the maximum permissible level is 0.2 milligrams.

The station at the Gavril Genov Plant recorded the highest atmospheric pollution, namely from 0.343 to 0.386 milligrams per cubic meter during the period from 2100 hours yesterday to 0300 hours this morning.

The specialists of the regional environmental protection inspectorate are quite certain that the pollutants come from the Giurgiu chemical plants, and today a group of experts left for Giurgiu to investigate.

Romanian Government Spokesman on Environment Cooperation With Bulgaria

*AU2808091990 Bucharest Domestic Service
in Romanian 1918 GMT 27 Aug 90*

[Mircea Rucareanu interview with Romanian Foreign Ministry spokesman Traian Chebeleu on "Romanian-Bulgarian Cooperation in the Field of Environment Protection"—recorded]

[Text] [Rucareanu] Today we would like to start our discussion with an issue with which our listeners are already familiar, that is Romanian-Bulgarian cooperation in the field of environment protection, an issue which—as is known—is currently being discussed by the two sides.

[Chebeleu] Indeed, the issue of Romanian-Bulgarian cooperation in the field of environment protection is connected with the prevention of pollution in the areas close to our state borders. The responsible groups in the two countries have focused on this issue for several years.

In the past 2 years, several meetings of government commissions have taken place in Romania and Bulgaria. During these meetings the sides agreed on several

actions, such as concluding a convention on environment protection in the area that is close to the Romanian-Bulgarian border. One of the measures was to set up a commission which includes the two countries' experts in the field of environment protection; the commission had the task of carrying out a joint survey in the Giurgiu-Ruse area, because the Bulgarian side claimed that the source of pollution in the town of Ruse is the Giurgiu industrial platform. As a matter of fact, in this respect a broad press campaign was carried out in Bulgaria. Although the survey showing that no chemical emanation was registered was carried out jointly, according to joint methods, and with equal participation of Bulgarian experts along with Romanian ones, the Bulgarian side refused to accept the respective conclusions. The creation of another commission of experts—also a joint commission—followed and their findings did not show pollution on the Romanian side, however the Bulgarian side again refused to accept the findings of their own experts who participated in the action of measuring the degree of noxiousness. The Bulgarian side continued to claim what was circulating in the Bulgarian mass media, namely that the source of pollution in the town of Ruse originates on Romanian territory.

As a neighborly gesture, the Romanian side halted the production of chlorine and, although the Bulgarian authorities expressed gratitude for this gesture, they continued to claim that the source of pollution is on Romanian territory.

Concomitantly with these technical measures, groups of experts belonging to the Foreign Ministries of the two countries started negotiating a convention between the two countries' governments, but its text could not be entirely completed because of some issues that were left unsolved and therefore, the convention could not be signed up to this very moment.

[Rucareanu] We know that Romania advanced certain requests to the Bulgarian side regarding a decision of the Bulgarian Government to build nuclear-electric power plants right near Romania. We would like to inform our listeners exactly what these requests were.

[Chebeleu] Indeed, from the very beginning, as early as 1974, the Romanian side drew attention to the danger posed for the Romanian population in the southern part of our country posed by the building of nuclear power plants at Kozloduy—plants which resemble the Chernobyl-type of power plant, that is, one without a protecting shield—and the danger posed by the nuclear power plants built, or which are being built, at Belene. These nuclear power plants were located at a distance of 1 and half kilometer from the Romanian border on the Danube, in spite of the fact that, at that time, the Romanian side expressed its disapproval of this action.

In case of an accident resembling the one at Chernobyl, the life, health, and the activity of the people in the localities on the Northern side of the Danube would be very seriously endangered.

As a result of this fact, the Romanian side insisted that all environment protection problems should be included in regulations and be negotiated. Although Bulgaria admitted the danger, more or less, it minimized this danger posed by its nuclear power plants. The Bulgarian side did not take a committed stand and tried to systematically avoid the discussion of the problem or tried to postpone solutions to the problem.

Finally, the Bulgarian side accepted in principle that the issue of nuclear power plants should also be included in the convention. However, this has not yet been accomplished. As a matter of fact, this is the major obstacle on the path of concluding this convention.

During the 4 June 1990 meeting between the prime ministers of the two countries' governments held in Bucharest, the sides agreed to set up a joint commission of governmental experts, which should examine the technical and technological situation of the chemical installations at the Giurgiu and Ruse industrial platforms with a view to finding out the possible sources of noxious emanation. They also agreed that on the basis of their discoveries, the two countries' governments should take measures, as the case requires, of closing or halting temporarily the respective installations. The sides also discussed possibilities to reestablish quality parameters for exchange of gases in the atmosphere. Similar measures and procedures were established for the nuclear power plants on the Bulgarian side of the Danube. At the same time, the sides agreed that their Foreign Ministries should step up the act of drafting the text of the convention.

[Rucareanu] Now it is the end of August, would you tell us what the current situation is?

[Chebeleu] Currently the situation can be summed up as follows: first of all the joint commission of governmental experts which was set up for the Giurgiu Ruse area has carried out the necessary survey and analysis and they will draw their conclusion on the basis of their findings and will present it to the government.

As we have learned from Romanian experts, their survey shows that the pollution of the town of Ruse is caused by that town's own resources and it does not originate on Romanian territory. Thus, the demands of the Bulgarian side to break up the chloride deposit from the Giurgiu industrial platform is not justified.

Secondly, the Romanian side paid a visit to the nuclear power plants on the Bulgarian side of the Danube. The conclusions of the Romanian experts resulted in the request to close down the 4 groups without protecting shields in Kozloduy, in order to disable them, to carry out a survey at the Belene group, and to halt the operation of siting new nuclear power plants at Belene.

The third point is that the discussions for drafting the text of convention have resumed. However, up to this moment, we could not break the deadlock, because the

Bulgarian delegation only has not failed to show a flexible position but also reverted to certain proposals that it made previously.

Recently a Bulgarian parliamentary delegation was received at the Romanian Parliament by a delegation led by a vice president of the Deputies' Chamber. The Bulgarian delegation handed over a document in which it essentially calls on the Romanian side to close the chloride deposit in Giurgiu. Discussions followed and the Romanian experts explained that in reality the source of pollution in Ruse is not on Romanian territory. Certainly, we are waiting for the joint commission of experts to present its conclusions and the conclusions of the joint survey.

The Romanian side insisted that in light of the decision made by the two prime ministers, all sources of pollution should be taken into consideration and the dimensions of the potential danger that the activity of another [word indistinct] implies should also be taken into account and all problems—those which the Bulgarian side is concerned about or which the Romanian side is concerned or worried about—should be settled, without evading or postponing any issue that might favor one side or the other.

In our view a comprehensive and concomitant settlement of problems is a reasonable and equitable way to treat problems connected with environmental protection between two neighboring countries.

Bulgarian Independent Trade Union 'Condemns Ecological Terror' From Romania

*AU3108072790 Sofia BTA in English 2127 GMT
30 Aug 90*

[Text] Sofia, August 30 (BTA)—The Executive Committee of the Confederation of Independent Syndicates in Bulgaria condemns the continuing ecological terror over Ruse and its 200,000 citizens. The independent syndicates insist before the government to adopt urgent additional measures for the fulfillment of the protocol as from July 4 this year and use all efficient forms to draw the attention of the international public. It is insisted that Ruse be declared a disastrous region and that an all-round and systematic observation over the health of the population be organized, particularly of children, that the needed conditions for treatment and restoration of the health of people be provided and the cooperation and help of the international health organizations be sought.

The confederation Executive Committee declares that it will adopt individual measures and draw the attention to the ecologic tragedy of the people of Ruse, for support from the national syndicate centrals, international syndicate associations and other non-government organizations. We will not hesitate and use extreme forms of civil and syndicate protest and pressure on the government, as well as on the Romanian authorities for settling this issue, the document reads.

There is an appeal to the National Confederation of Free Trade Unions, to the Federation of Free Trade Unions in Chemistry and Petro-Chemistry in Romania to render support not by words but by actions for an outcome from this situation and the Romanian Government is urged to take immediate measures.

Hungarian Environment Committee Meets on Boes Power Station

*LD2508110590 Budapest Television Service
in Hungarian 1730 GMT 24 Aug 90*

[Excerpt] [Announcer] The National Assembly Environmental Protection Committee has held a two day session on-the-scene at Dunakiliti and Boes. The interest has only been heightened by the Slovak prime minister's recent announcement that his country wanted to commission the Boes Power Station under any circumstances. The two government commissioners for the works have also met.

[Unidentified correspondent] The Hungarian side has informed its partner that our government would want to understand the statement of the Slovak premier about the building of the Boes Power Station that this was not a repeat of the blackmail practiced by the former power [in Prague], that is that the diversion of the Danube was out of the question. The Hungarian Government commissioner has also asked that the national minorities should not be used to reach a compromise. According to the Slovak Government commissioner, agreement is impossible without compromise.

The National Assembly deputies have expressed doubts about the water refilling system at Dunakiliti. They have observed that at the Boes side, the works are continuing, the turbines are almost ready, but the greens' resistance on the other side is much stronger there, too, than it has been in the past. Boes is important not only to the contractors but in the changed historical situation it is also important to the Slovak political tendencies which are also becoming independent of Prague from the standpoint of energy.

We have asked the chairman of the National Assembly Environmental Protection Committee [Miklos Lukats] whether the committee's view had changed as a result of their experiences on the site.

[begin (?Lukats) recording] Actually, not. [passage omitted] [end recording]

CZECHOSLOVAKIA

New Incident at Bohunice Nuclear Power Plant Reported

*AU2408121990 Vienna WIENER ZEITUNG
in German 22 Aug 90 p 1*

[Unattributed report: "CSFR: Incident at Bohunice Nuclear Power Plant"]

[Text] Prague—The CSFR Nuclear Energy Commission in its report on the second quarter of this year has

disclosed an incident in the controversial Slovak Jaslovské Bohunice Nuclear Power Plant. In early June an "extraordinary interruption" occurred in the first block as a result of the failure of an oil pressure control device. Otherwise the operation of Bohunice was "stable."

The CSFR Nuclear Energy Commission stated that the operation of all installations in nuclear power plants is "reliable and stable." It was further stated that a total of 205 guidelines on the operation and the design of nuclear power plants were issued in the first six months.

Jaslovské Bohunice Nuclear Reactor Leaks Said 'Grave'

*AU2708084590 Bratislava NARODNA OBRODA
in Slovak 20 Aug 90 p 7*

[Stefan Marusak article: "Half-Life of the Loss of a Feeling of Safety; The A-1 Nuclear Power Station Does Not Operate, But the Risk Persists"]

[Excerpts] The V-1 nuclear power station at Jaslovské Bohunice has in recent weeks moved into the center of attention, not only of Czechoslovakia, but possibly of the whole of Europe. Yet the V-1 is not the only nuclear power station at Jaslovské Bohunice. Jaslovské Bohunice is also the site of the more modern V-2 power station, and of the older, A-1, nuclear power station, which is unfit for use following an accident.

Speaking in the debate in the Federal Assembly's Committee for the Environment on 22 May this year, Deputy Pavel Sremer from Bratislava raised the problem of the wrecked A-1 power station, saying that tritium with a volume activity [objemova aktivita] of 24,000 becquerel per liter had been ascertained in underground water underneath the power station. [passage omitted]

Emil Bedi, doctor of natural sciences, head of the department for nuclear power stations at the Bratislava Regional Health Office, says about this problem: "The problems at the decommissioned A-1 power station are extraordinarily grave. Tritium-contaminated underground water has been discovered on the premises, in a depth of 20 meters. The radioactivity level reached a volume activity of 24,000 becquerel per liter.

"Radioactive waste is deposited on the premises of the A-1 nuclear power station—in lid-covered containers which are practically of an unsecured nature. All kinds of aggressive chemicals have been stored in them for 20 years. As is becoming apparent, the construction barrier [stavebna bariera] is inadequate, and these substances are leaking into underground water resources. But this is only one of the possible sources of contamination.

"The crux of the problem is not the ascertained level of the volume activity of tritium, but the fact that we do not have the leakage under control. Our office is in charge of monitoring everything emitted from the nuclear power

station. Our measuring devices monitor everything which flows into the Dudvah River as well as all gaseous emissions escaping through the chimney."

The health officers do not know as yet what level of activity is hidden in greater depths [below 20 meters] or closer to the surface. They do not know what levels were there in the past, or how long the underground water resources on the premises of the A-1 nuclear power station have been contaminated. It is quite possible that the levels of one or ten years ago were much higher.

The inspection of wells in the surrounding villages and near the Bohunice Nuclear Power Station has not revealed any increased [radio]activity. In other words, there is no threat to the population for the time being.

What about the norm? Has the admissible norm been exceeded? [passage omitted]

"The norm is strange—it permits only 1 becquerel per liter," says Dr. Bedi. [passage omitted] "The permitted level of 1 becquerel (tritium) per liter is a value that is impossible to comply with. In drinking water we routinely measure values of the volume activity of tritium of between 10 and 100 becquerel per liter. A value below 10 becquerel per liter is, in fact, impossible to measure so that, in the case of tritium, the limit of 1 becquerel per liter is nonsense."

Besides tritium, strontium (which, like tritium, emits beta rays) and cobalt 60 (which emits gamma rays), too, have been ascertained in the underground water.

"In the case of cobalt 60," Doctor Bedi says, "we ascertained 7 becquerel per liter. This clearly exceeds the norm for drinking or underground water, and there is nothing to be discussed here."

The important thing is that no one has the emission of radiation under control, and that the emitters from underground water have not found their way into the statistical sheets which are used in calculating the [radiation] doses received by the population....

The half-life of tritium, which is the heaviest isotope of hydrogen, is 12 years. This means that, in 12 years, the ascertained 24,000 becquerel per liter will be reduced to 12,000 becquerel, in another 12 years to 6,000 becquerel, and so forth. As can be seen, the level of radiation will be high even after 36 years. The half-life of cobalt 60 is five years.

"Substantially higher values than in underground water," Dr. Bedi continues, "have been ascertained in samples [of soil] in the immediate vicinity of the containers. This means that the starting values are much higher. We claim that the containers are not impermeable but the user claims the opposite. He explains the high level of [radio]activity by the overfilling of containers in 1984. At that time their content—a highly active liquid—ran out of the containers. Another cause was floods, which came from the fields and inundated the power station's premises. The true reason is hard to

identify. It is undeniable, however, that there is activity near the containers and it is beyond our control. We therefore issued a ban on the use of the aforesaid containers, and ordered that all soil with radioactivity levels in excess of 100 becquerel per kilogram be eliminated." [passage omitted]

Yet there are also other containers on the premises of the nuclear power station which contain solid waste. This waste comprises various contaminated articles, starting with parts of the fuel rod casings and ending with pieces of cloth used during deactivation. This storage place is flooded with water.

"The impermeability of this storage place is not guaranteed because the water level has fallen here," says Dr. Bedi. "We therefore issued an order that the contents of this storage place be eliminated. It is impossible to do this manually, however, and the standard of machinery and automation in the A-1 nuclear power station is very low."

Ever since the accident (1977), highly radioactive waste, including spent fuel, has been stored at the A-1 nuclear power station. Some of the spent fuel rods cannot be taken out of the cassettes in which they have been stored and cooled. Some of the rods have increased in volume, others have fallen apart, etc. The rods' casings will have to be cut apart and, unconditionally, taken away from the storage place because the storage depot has outlived its service life. A crack in the depot's wall would result in an accident of a scale which Czechoslovakia has not yet experienced. At the same time, the high level of radioactivity makes it impossible to carry out a check of the quality of the depot's welding seams. [passage omitted]

The cost of the liquidation of the A-1 nuclear power station has been estimated at 1.2 billion korunas. No other accident in Czechoslovakia so far has required a sum of such magnitude. At the same time, a detailed concept of the long-term liquidation of the A-1 nuclear power station has not yet been adopted. The A-1 has been out of operation for 13 years but its liquidation could still take decades. [passage omitted]

I admit that, on leaving the nuclear power station at Jaslovské Bohunice a few days ago, I had a safe feeling. Conversations with representatives of the power station had a calming effect on me. Their rationally argued assurances that everything in the V-1 and V-2 power stations is under the control of knowledgeable experts convinced me.

My feeling of safety did not last long, however. After the words of the health officer [Dr. Bedi] that the leakage of radioactive substances from the premises of the A-1 power station is not under control, my feeling of safety was reduced by half.

GERMAN DEMOCRATIC REPUBLIC

Low Radioactivity Near Nuclear Plants Reported

AU2908122690 East Berlin NEUE ZEIT in German
24 Aug 90 p 1

["W.H.-NZ" report: "Radiation Very Low"]

[Text] East Berlin—The measuring and supervision of the levels of radioactivity near nuclear power plants, in mining areas, and throughout GDR territory have yielded a satisfying result concerning the amount of radiation to which the population is exposed. This is said in the 1989 annual report on environmental radioactivity, in which the State Office for Nuclear Safety and Radiation Protection notes that the legally prescribed threshold levels have not just been observed but that actual levels were generally far lower.

At a news conference on topical questions of radiation protection, Eckhard Ettenhuber stated that no case is known in which the limits have been exceeded. The studies of the strain on the environment caused by natural and artificial radiation sources have shown, for instance, that coal power plants and nuclear facilities have the same values, measured in the millisievert system (mSv), which are 0.002 mSv or even lower. However, there is a certain pent-up demand concerning safety technology.

Radiation doses of 1.0 to 1.5 mSv per inhabitant per year, which is valid for both the GDR and the FRG, can be used for comparisons. The dose of radiation is illustrated even better if one takes into consideration that a thorax X-ray causes about 2 mSv of exposure. Radiation levels do not exceed the limits in mining either. Nevertheless, for health considerations, research and investigation measures are carried out in old mining areas and bismuth processing facilities, where radiation levels were kept secret in the past.

HUNGARY

Minister Proposes Environmental Legislation

LD2708134990 Budapest Domestic Service
in Hungarian 0845 GMT 27 Aug 90

[Speech by Justice Minister Istvan Balsai at the National Assembly session in Budapest—live]

[Excerpts] Esteemed Mr. Speaker, Esteemed National Assembly. You are well aware that one of the important requirements for the change of system currently underway, in connection with the government system, is its modernization, which obviously entails, by necessity, the partial transformation of the central organs of administration. [passage omitted: recalling related legislation enacted by the new National Assembly since May of this year]

Esteemed National Assembly, I would like to point out, in a few sentences, the most important tasks which

appear at a legal level in the bill, requiring legal amendment. I would like to mention, as an important element, the dividing up of the central direction of environmental protection and water management tasks, bearing in mind that environmental protection considerations should be asserted consistently in the course of conducting water management activity. According to the proposal, water management and the management of water affairs would be put under the jurisdiction of the minister of transport, telecommunications, and water affairs [kozlekedesi, hirkozalesi as vizuegyi minister]. At the same time, the bill separately lays down the guarantee that the stipulations changed under the direction of environmental protection must be enforced by all means in the course of water management and the direction of water affairs.

The increased priority to be given to the role of environmental protection, which up to now has been unjustifiably neglected, is indicated by the provision of the proposal, which stipulates at the legal level that the central tasks concerning the direction of construction affairs will belong to the duties of the minister of environmental protection and regional development [kornyezetvedelmi es teruletfeljesztési minister].

Worthy of mention, concerning the construction industry, is the bill's regulation to the effect that jurisdiction over economic activity and the management and control of the construction industry in the future will be exercised by the minister of industry and trade, in a manner and to an extent which is determined by government. As a result of this solution, public opinion will be reassured concerning the earlier overlapping, which very often gave rise to just criticism, in that the central direction and supervision over activity by the authorities and the contractors will be separated in the construction industry.

Last but not least, I would like to point out that the bill reflects the change which has taken place with the rebirth of the ministry of labor and in connection with skilled training outside of the school system. The renewed tasks of the minister of labor justify that the minister of labor should perform the central, branch supervision and direction of skilled training outside the school system, and related to this he should exercise jurisdiction regarding management of the skilled-training fund.

Esteemed National Assembly, these are the most important changes contained in the bill to amend the law; this bill, in harmony with the development of the tasks and jurisdictions of certain ministries which in the meantime have changed, indicates the government's endeavor aimed at the creation of effective and better quality government work. For this reason, I ask the esteemed National Assembly to enact the bill into law, after having debated it. Thank you for your attention.

Lead Contamination in Budapest Suburbs

Local Official, Scientist Comment

90CH0235A Budapest NEPSZABADSAG
in Hungarian 30 May 90 pp 1, 4

[Article by Peter Vajda: "Lead Alert at the Edge of the City: Why the Garden Produce Cannot Be Consumed in Nagytetyeny?"]

[Text] This past weekend a loudspeaker-equipped police car cruised District XXII, some of the streets of Nagytetyeny. The residents listened incredulously as the Office of Public Health and Epidemics [KOJAL] cautioned them against eating vegetables and fruits growing in their gardens as they might be harmful to their health. A number of people live here throughout the year, and the region also has many weekend houses, too; which means that most of the residents grow their own lettuce, spinach, strawberry and cherries. Now people are asking: How long have they and their children been eating produce containing lead in amounts 10 or 20 times as high as allowed by law; by whom and when will they be compensated for any damages? What has happened?

That is what we tried to find out, starting our inquiry with a Major, Dr. Istvan Komaromi, who is the police chief of the District. He told us that as soon as they received the data which referred to the contamination of the products in question, they dropped everything and started alerting the residents. Even this talk with the District chief revealed that it took nearly a month before results of the tests taken on 24 April reached the District XXII council and the police. The president of the District council, Jeno Csobanki, told us that about 3,000 individuals live in the area which recent tests show to be threatened. The police chief and the council president told us that even before the tests were undertaken it was certain that any excess contamination must be coming from the Metallochemia plant which long performed as a lead foundry and which presently performs the collection and crushing of used car batteries. The Metallochemia has been exposing the district to severe lead contamination for at least 10 years.

However, even the person in charge of the test performed in late May, Dr. Peter Szabo of the Plant and Soil Protection Service [NTVSz], did not expect contamination to be as severe as it turned out. Plant tests were performed in seven locations, involving spinach, lettuce and sorrels. The allowable maximum lead content is 0.3 milligrams/kilogram; this value was exceeded everywhere, at times as high as 24 fold. Soil tests also yielded results many times over the allowable limit; at times as much as 10-12 times as high. In the walls of the drainage system, through which waste is removed from the Metallochemia and another chemical plant, lead content was fifty times as high as the allowable value.

I asked Dr. Szabo if we can reach final conclusions. He readily admitted that it was too early for that, and stated that control and auxiliary tests are being prepared which

would shed more light on details. He also responds to a statement made by one of my interviewees: According to that, the situation gives no cause for great alarm; after all, it is possible that the crops are contaminated entirely from the air, from the dust blowing toward the gardens. If this were true, the vegetables and fruits would simply have to be thoroughly washed (as recommended after Chernobyl), and that would take care of everything ... The researcher does not share this optimistic view. According to him, further tests may reveal this to be the case. More likely, however, both causes are at work: rain washes contamination from the soil to the plants (after all, heavy metals break down extremely slowly in the ground), while dust also contributes to the problem. However, even if we talk about dust alone, there is no guarantee that every child will wash the cherry before eating it, and then we had not even mentioned the fact that we also have to breathe the air ...

"Since June 1989, more and more people came to see me," said Dr. Peter Meszaros, District XXII's representative in the National Assembly, "since I headed the environmental task force of the District MDF. That was also the time when an article appeared in the journal *MEDICUS UNIVERSALIS*, showing that the rate of cancerous illnesses is four-six times as high in Nagytetyeny than elsewhere in the country. We used residential forums to start measuring the sources of environmental contamination, and that was how we came to hypothesize that the hazardous materials used by the Metallochemia and the Chinoin may contribute to the situation. At the Metallochemia they process lead, copper and zinc. They crush the collected lead batteries in an open shed, before transporting them to East Germany. Copper and zinc are subjected to foundry processes and lead is being poured at the plant. Thus, poisonous by-products fly above the district through the plant's chimneys. If we were to go down the streets near the factory, we would find that nearly every second household has someone suffering from a serious illness. We wrote a letter to the Ministry of Environmental Protection. When the Ministry declined to address the problem, we decided to remedy it ourselves. We established the "Green Future" association for environmental defense. We contacted the enterprise, but received no satisfactory answer and no substantive measures have been taken. At the time we did not know that the KOJAL had already performed tests in the district, without making the test's results public. All this has come to light now that a landslide has been started. It was last Saturday that results of the test conducted at the request of our association by the Plant and Soil Protection Service were made public. "I consider the figures shocking," said Dr. Peter Meszaros.

"Further tests need to be performed. I also believe that people living in the neighborhood must be given material compensation. We already know that the Metallochemia's environmental pollution has affected 12,000 individuals in the region. If necessary, I will address the National Assembly on this topic," said the deputy.

Three thousand, as the council believes, or 12,000? Further study will provide the answer: obviously, we have to expand the circle drawn around the Metallochemia plant. More than two weeks ago, when results of the latest test were not yet known, the head of the District's KOJAL stated: "According to the latest scientific information, I know of no data that would justify having to resettle people from the district and suspend the factory's operations." Is it certain that he is correct?

Factory Environmental Program Defended

90CH0235B Budapest NEPSZABADSAG in Hungarian
4 Jun 90 p 4

[Interview with Ferenc Gyurcsa, worker at the Metallochemia plant, by P. M.; place and date not given: "What Does the Metallochemia Want? In the Traces of the Lead Alert."]

[Text] The article "Lead Alert at the Edge of the City," published in our paper on May 30 by the deputy from District XXII, Dr. Peter Meszaros, hypothesized that the lead content of vegetable and fruits in and around Nagytetyeny is much higher than the allowable level, because Nagytetyeny and its neighboring settlements are "flooded by the hazardous and dangerous materials used by the Metallochemia and the Chinoi plants." On behalf of the workers at Metallochemia, Ferenc Gyurcsa came to our editorial offices Thursday, and told us that based on a decision of the KOJAL [Public Health and Contagious Disease Station], production at the plant was stopped as of 1000 Tuesday. He also gave us an open letter, addressed to Dr. Peter Meszaros, signed by 166 of the factory's 280 workers who called a meeting after work was stopped.

[P.M.] What is in the letter?

[Gyurcsa] It describes what great efforts we have made since 1977 to save Nagytetyeny and its environs from further environmental pollution. We object to the fact that the "Green Future" association is not always willing to accept test data released by relevant agencies of environmental protection and the KOJAL which approve of our efforts. We feel that it is important to distinguish between our activities before and after 1977. We do not doubt that the lead foundry activities performed between the establishment of the plant in 1908 and recent years represented a significant burden for the environment. Since we no longer perform such activities, I can state that since 1977 the level of lead emission has been within allowable limits.

[P.M.] As of now, what could be considered a source of danger at the plant?

[Gyurcsa] Starting with 1980, the Metallochemia acquired the right to collect from [metal recycling points] the 25,000 tons of discarded motor vehicle batteries, and forward it to East Germany for further processing. This put an end to the previously existing situation in which various recycling points throughout the country crushed

the batteries, thus polluting the environment in many more locations. The environmental picture would have improved greatly if the Discarded Battery Processing Plant would have started operating at our factory right away. Emission levels at that plant are lower than what is now being measured at the Astoria Hotel [in downtown Budapest]. However, since this did not happen, we had to make investments to satisfy environmental protection standards, even if this meant cutting into our wages.

[P.M.] According to Mr. Meszaros, the crushing of batteries takes place in an open shed at your plant. Is this true?

[Gyurcsa] We are also upset by the fact that the deputy did not visit our factory: If he did, he would have seen that the battery storage area is covered; we are able to sprinkle the batteries from the roof, and thus reduce the dust that is created when the batteries are crushed.

[P.M.] In the end, what is it that you would like to see happen?

[Gyurcsa] We would like to see a situation in which responsible agencies or individuals would rely on trustworthy official test results to evaluate our plant's actual effect on the environment.

Public Health Authority Comments

90CH0235C Budapest NEPSZABADSAG in Hungarian
4 Jun 90 p 4

[Unattributed, untitled article.]

[Text] Our reporters also talked to the KOJAL [Public Health and Contagious Disease Station] concerning the matter of lead contamination. We were told that the ominous test results could not come as a surprise to the people in charge, because previous tests showed similar results. It is also a fact that residents have been previously cautioned against growing vegetables and fruit in the area, but such warnings were not heeded. What is more, after they started billing residents for water, owners of the area's family dwellings reopened and used previously capped wells.

The problem is further complicated because the previous practice was that polluters of environment paid a fine and everything continued as before. Shutting the plant down could represent additional dangers; there will not be anyone to collect the discarded batteries, while their owners will continue discarding them, creating new environmental hazards. One solution is to modernize the plant, replacing the old technology with a new one. A protected zone could also be established around the plant, and the plots could be purchased for this purpose, with compensation paid to the owners. Due to a lack of financial resources, these solutions are beyond the capacities of both the plant and the local council. We have also found out that the local council's president called for the appointment of a commissioner to conduct the investigation and take the necessary measures.

POLAND**Environment Inspectors To Visit Soviet Bases**

*LD2908194890 Warsaw PAP in English 1756 GMT
29 Aug 90*

[Text] Szczecin, Aug. 29—Polish environmental protection inspectors have been given free access to the Soviet military bases following talks between Poland's plenipotentiary for the stationing of Soviet troops in Poland and

the plenipotentiary of the Soviet side held in Szczecin, an official of the voivodship office in Szczecin told newsmen.

Szczecin inspectors chose for their first inspection a Soviet navy base in Swinoujscie where there is a well-founded suspicion that petroleum-derived substances have poisoned the aquiferous layer and polluted ground waters.

Environmental protection inspectors also plan to check several other bases, including two Soviet airfields near Chojno and Kluczewo.

INTER-AMERICAN AFFAIRS

Caribbean Environmentalists To Meet in St. Lucia

FL2908174790 Bridgetown CANA in English
1712 GMT 29 Aug 90

[Text] Castries, St. Lucia, Aug 29, CANA—A number of critical issues affecting the environment will be discussed when the 24th annual congress of the Caribbean Conservation Association [CCA] convenes here Thursday. More than 150 participants from the Caribbean along with representatives of leading environmental organisations around the world are arriving here.

Yves Renard, outgoing president of the Barbados-based CCA, told CANA [CARIBBEAN NEWS AGENCY] that delegates would consider a number of technical issues such as aspects of land use planning, heritage tourism, and the role of the media in environmental awareness. Renard said that particular attention would be paid to tourism development and the preservation of the environment.

"The CCA is concerned that tourism development must take place in harmony with efforts to preserve the environment. It does not have to be destructive, but very often it is and this will be dealt with from both sides," Renard said.

The organisation was founded in 1967 with the objective of conserving the Caribbean region's natural resources and cultural heritage. Though it is a non-governmental organisation, 19 governments of the region, including the Commonwealth Caribbean, the French and Spanish territories, and the United States Virgin Islands, are members.

The CCA official said it is expected that the congress would attempt to define the priority environmental issues confronting the region and delineate a strategy for conservation as the region enters the decade of the 1990's.

BRAZIL

Satellite To Aid Sao Paulo State Forest Conservation

PY2508010590 Brasilia Domestic Service in Portuguese
2200 GMT 24 Aug 90

[Text] Sao Paulo State will have a program for the permanent observation of vegetation by satellite. The program will be known as Green Eye, and will be implemented this coming Monday, 27 August, by the Environment Secretariat.

Observation of vegetation in the Sao Paulo territory will be conducted by the Landsat 5 satellite. The Green Eye program will prevent the destruction of native vegetation and make it possible to spot illegal land clearing. The information collected by the satellite will be transmitted to regional units of the Environment Secretariat and the Forestry Police, who are responsible for enforcing conservation laws.

COLOMBIA

ELN Blamed for 'Ecological Terrorism' Near Popayan

PA2908202690 Bogota Inravisión Television Cadena 1
in Spanish 1730 GMT 29 Aug 90

[Text] There are violent groups which do not want to leave the country alone. First it was actions against oil pipelines, then against forests, and now fish are the victims of ecological terrorism. The so-called Army of National Liberation, ELN, has caused 250,000 trout for export to die when it poisoned the waters of a fish farm near Popayan, capital of Cauca Department. It has also been reported that part of the water supply of Popayan might have also been polluted. According to observers, losses are estimated at more than 80 million pesos. Here is a report by Carlos Arturo Paez:

[Begin Paez recording] The video you are seeing shows the horrifying spectacle of a new method of terrorism. The workers of the El Diviso farm found dead close to 250,000 trout, weighing a total of 35 tons and costing 60 million pesos. Criminal hands poisoned the waters of Las Piedras Creek, causing the disaster. Although the substance that was used and the perpetrators of this action have yet to be determined, the authorities believe it was done by the ELN. Their theory is based on the fact that 10 days ago this subversive group set fire to hundreds of pine trees in La Meseta, a few kilometers from the fish ponds.

This disaster worries the Cauca Department health agencies because the creek is used to supply the Popayan aqueduct. Water samples are being taken to decide whether restrictions on water consumption should be set.

If it is proven that the ELN committed this act of vandalism, the country will have been the victim of what experts describe as ecological terrorism. Although the latest action was carried out against the fish, in the past crops have been set on fire and rivers have been polluted when oil pipelines have been blown up. Colombia has yet to establish the magnitude of the losses from the (?13) attacks staged this year, or to determine how much it will cost to accomplish an ecological recovery in these areas. [end recording]

INDIA

Panel Favors Law on Project Environmental Assessment

90WD0566 Bombay *THE TIMES OF INDIA*
in English 28 Jun 90 p 9

[Text] New Delhi, 27 June (PTI)—There must be a statutory environmental assessment of all projects and activities having a potential impact on environment before implementation planning commission experts feel.

Even projects cleared earlier, without an adequate environmental assessment, which for some reason have not been completed, should be required to undergo an environmental impact assessment.

Based on such as assessment, a decision should be taken to abandon or modify them, says a draft "approach to environment and forests in the eighth plan" prepared for a discussion between socio-economic groups on environment and the planning commission here yesterday.

Noted environmentalists and activists like Mr Sundarlal Bahuguna, are participating in the discussions being held as part of a series of interactions between the commission and various socio-economic groups in the formulation of the eighth plan.

Listing various strategies of prevention and regulation, the paper says to fight the threats to nature, two broad strategies are possible—preventive and regulatory.

As part of prevention strategy, it says for certain types of threats, raising of public awareness is adequate. Most people would progressively desist from harmful activities, to which they have other options, if they are convinced of the dangers. The success of anti-smoking publicity campaigns, in many parts of the world, lend credibility to this strategy.

Secondly, strictly laws, rigorously implemented, can also provide the required deterrence to proposed environmental destruction.

It is important to adopt the strategy of punitive deterrence, both through fiscal measures by making wasteful and non-essential consumption very expensive and through the strict application of strong laws.

However, the paper says, legal and punitive methods are only effective if they are sensitive to the socio-economic constraints of people.

Unfortunately, much of the present laws and regulatory mechanisms do not distinguish between those who have a choice to destroy nature and those who do not. In fact, they are mostly used against the poor, who are also usually without real options.

It says another way of prevention is to regenerate nature and increase productivity of ecosystems to a point where they are not degraded by existing demands and activities.

It must be recognised, that in the long run, legal regulatory methods cannot by themselves protect environment, or promote a healthy relationship between nature and society, or society and government. Also, one cannot, forever, deny access to vital resources if no alternatives are available, the paper says.

On strategy of regulation, the paper says where activities have started, or projects come up, the impact on environment must be strictly regulated.

However, despite past efforts at protecting nature through laws and regulations, the increasing degradation of water, air, land, forests and wildlife bears witness to the fact that this approach has not been successful.

Apart from having inherent limitations, its application has been half-hearted, without involving the people. Much of the process is carried out by the government often in secrecy without involving people.

"Information about the threats, their sources, and the decisions and action taken by the government is rarely made public," it says.

On formulation of policies and laws, the paper says an important task before the government is the formulation of a national policy on nature and natural resources. The policy should contain sections on major elements like land, water forests and air on significant sectors like agriculture, energy, housing, industry, mining and roads.

This policy must be evolved in consultation with the people and must have the support of the government, across departments and levels.

From such a policy must follow national and regional land use plans specifying long term land use patterns for the country and for each region.

The paper also says that various laws relating to the environment, which are of colonial heritage and no relevance to present day, should be in tune with the current environmental and social thinking. Unless this is done there is little hope of establishing a system of just and sustainable development.

The paper says "what is required, therefore, is a review of existing laws to bring them in line with the proposed natural resources policy. These laws must also reflect the social and economic reality of our country, and recognise compulsions of poverty and lack of real choices as mitigative factors."

"All laws must grant locus standi to non-governmental individuals and organisations. These laws, and the related procedures, should be "people-friendly," accessible to all, and should be backed by comprehensive and realistic standards for various environmental parameters

(water pollution and land pollution) ensuring that they take into consideration accumulative impacts, both over time and from multiple sources."

The paper suggested that the government of India present an annual natural resources budget to parliament, which would outline the proposed use of water, land, forest and other resources.

The paper says that the "right to work" promise made by government could be realised by creating jobs related to regeneration and restoration of eco-systems, especially if these involve tribals and economically weak segments of society.

It also calls for decentralising control over natural resources. However, decentralisation in this context, does not mean transfer of control from Central to state governments or from state governments to district authorities. In reality, it means transferring control from government to people.

A draft note on rehabilitation policy, circulated for the discussions says such a policy should cover all people affected by developmental projects and other activities of the government, public and private corporations, like dams, mines, ports, towns, defence establishments, reservation of forests and setting up of national parks and sanctuaries.

This policy includes those directly displaced by the project in the sense that the project takes over their land and thereby forces them to move.

The other categories to be covered are those indirectly displaced by the project in the sense that the project makes it difficult and impossible for them to continue living in their traditional homes and those affected by the project but not actually displaced in the sense of a deterioration of their economic social, cultural, geographical and environmental aspects of life.

It suggests that a commission on rehabilitation with non-officials could be set up, initially at the Centre and regionally, and finally in each state and, in larger states, of each sub-region of the state.

It says in determining the package to be offered to the displaced persons, it is important to ensure that all those displaced, irrespective of what their earlier social and economic status has been, are provided adequate physical and financial resources to ensure that they live above the poverty line or some other pre-determined levels.

Automobile Pollution in India Reported at 'Alarming' Level

90WD0567 Bombay THE TIMES OF INDIA
in English 22 Jun 90 p 3

[Text] Bombay, 21 June—Automobile pollution in India has today reached alarming proportions that apart from the manufacture, and the user, even the government too had a role to play in curbing it.

This was the thrust of the discussions at the 2-day national symposium on "Automobile pollution monitoring—its effects and control," organised by the National Society for Air Pollution Control, here from today.

The chairman of the central pollution control board, Mr Paritosh Tyagi, said that while the urban population was going up at a rate of 4 percent annually, the figure for vehicles was a staggering 30 percent. But, the present infrastructure to face the vehicular boom was far from adequate, which would inevitably result in a rise in pollution level.

Pointing out that the problem of vehicular pollution was common, he said that vehicle designers had to tackle this issue on a urgent basis. This could be done by designing vehicles in such a way that they would not cause pollution.

Apart from technological aspects, he said, that emphasis has also to be placed on the operational side as well. This could be done by improving the training in driving schools and carrying out scientific research on automobile fuel. On the economic side, the present debate was whether to eliminate lead in petrol, he said. Discussions were also on about replacing two stroke engines with four stroke engines in two-wheelers.

With regard to the role of the government in helping to reduce pollution, he wondered why the 33 reports regarding the implementation of the mass transit scheme was gathering dust. The mass transit plan included the construction of freeways and expressways, he said.

About the social aspects of curbing pollution, he said that system of pooling cars and sharing vehicles must be encouraged. According to him, there had to be a social movement to create an awareness about pollution since regulatory measures had not shown much positive results "Cost effectiveness through regulatory control was poor," he said.

The director of Vehicles Research and Development Establishment, Ministry of Defence, Brigadier R.K. Joshi said there were different perceptions about air pollution control. "But, I think we can take it for granted that there was a unanimous view that pollution was a great menace." He said automobiles were contributing a lot to the pollution level in Bombay and Delhi.

He regretted that awareness about pollution dawned in this country rather late and the measures initiated to tackle it were rather delayed. "All these should have been done a long time ago," he said.

He forecast that the coming years would see a vehicular boom in Bombay and Delhi, increasing the pollution level. He, therefore, called for an integrated approach to tackle the problem.

While stating that the onus came on the user to curb pollution, he said that the manufacturer too had a responsibility in reducing it. The implementation of the

Motor Vehicles Act and rules was just the beginning in attempting to curb vehicular pollution, he said.

The executive director of Automobiles Manufacturers Association of India, Mr S.G. Shah, stressed that the Indian automobile industry was committed "save the air" and "save the earth." Agreeing with the fact that there was a absolute need to curb vehicular emission levels, he asked as to how this could be achieved and added that effective norms need to be framed for this purpose.

According to Dr S.M. Sarin and Mr Sharfuddin of the New Delhi-based Central Road Research Institute, in the metropolitan cities the contribution of various emission in the air pollution from automobiles was about 70 percent. "Thus an urgent need was felt by various agencies, including traffic and road authorities to control this growing menace of air pollution," they said in their paper.

They said besides, engineering measures such as improvements in vehicle design, various techniques in urban road and traffic planning and traffic management

were now available to minimise the quantum of vehicular emissions and improving the air quality.

Professor Dr H.B. Mathur, mechanical engineering department, Indian Institute of Technology, Delhi said that one of the major sources of environmental pollution was provided by modern means by surface transport propelled by gasoline-operated light vehicular engines or diesel-powered heavy vehicular engines.

Speaking on the "Future Emission Standards for Automobiles—the Need for a Multi-Pronged Approach," Mr R Ramakrishnan, Ashok Leyland, Madras, said that in order to tackle vehicular pollution there had to be a multi-pronged approach comprising various agencies comprising engine and vehicle manufacturers, component manufacturers, oil companies, research and development institutions and environmental and pollution control agencies.

Earlier, the president of the National Society for Air Pollution Control, Mr P.R. Gharekhan, also addressed the gathering.

Commission Reviews Draft USSR Environment Law

90WN0157A Moscow IZVESTIYA in Russian 1 Jun 90 Morning Edition p 4

[Session of the State Commission of the USSR Council of Ministers for Emergency Situations: "When Nature Is in Danger"]

[Text] The Commission reviewed and basically approved the draft USSR Law on the Protection of the Environment. The basic aim of the draft law is to protect the nation's natural wealth, to use them rationally, to provide the reproduction of the natural resources, to prevent the harmful impact of economic and other activities on nature, to ameliorate and improve the state of the environment, to strengthen legality, law and order in the sphere of social relations, to reinforce the rights of citizens for an environment favorable to life. In comparison with the current legislation, the draft law broadens the range of protected natural objects, considering as these the plant world with its entire specific diversity, other components of the natural ecological systems and biosphere, the climate and the ozone layer of the earth along with the land, its mineral wealth, soils, waters, atmospheric air, forests and animal world. The concept of "a zone of emergency ecological situation," "an ecological disaster zone" and others were formulated.

The draft law defined and delimited the competence in the sphere of governing relations on environmental protection of the USSR, the Union and autonomous republics, the krais, oblasts, districts, rayons and cities.

After further work on the draft law and after bringing it into full conformity with the recently adopted legislative enactments, it will be submitted to the USSR Supreme Soviet.

Pursuant to monitoring the course of carrying out the Decree of the USSR Council of Ministers of 3 May 1984, the question was examined of recovering, decontaminating and storing toxic industrial wastes. It was pointed out that the accumulating of toxic wastes at industrial enterprises, the dumping of them on municipal dumps, in ravines, quarries, and unauthorized burying in the ground in many instances cause polluting of the surface and underground waters, the land and atmospheric air. Thus, the accumulation of toxic wastes at the Ust-Kamenogorsk Lead-Zinc Combine, at the Rubezhanskiy Production Association Krasitel [Dye] and at the Lisichansk Soda Plant has involved the polluting of the underground waters in concentrations which surpass the permissible by several-fold. Unsanctioned dumping of industrial wastes at the Gorlovka Chemical Plant has been the source of the seepage of harmful toxic substances into the Aleksandr-Zapad Mine and this caused the poisoning of miners and mine rescuers in December 1989. The polluting of the environment with pesticides has also evoked serious concern. But, regardless of the acuteness of the problem, the USSR Minmetallurgiya [Ministry of Metallurgy], the USSR Minkhimneftprom

[Ministry of Petrochemical Industry], the USSR Minavtoselkhoz mash [Ministry of Automotive and Agricultural Machine Building], Agrokhim [Agricultural Chemistry Administration], other ministries and departments the enterprises of which form toxic wastes as well as the Union republic councils of ministers have actually been removed from working on this problem and as a result many of the quotas set by the decree have not been carried out. Over the 6 years which have passed since the adoption of the decree, not a single regional interdepartmental grounds has been built for decontaminating and storing toxic wastes. Up to now, technologies have not been developed for the recovery, decontamination and storage for a majority of the toxic compounds and the measures are not being taken to create the necessary equipment, instruments and other technical means for this.

The commission has instructed the USSR ministries and departments and the Union republic councils of ministers during the current year to carry out a one-shot inventorying of the toxic industrial wastes and on the basis of this implement measures aimed at improving the existing situation and, in particular, build a network of economically and ecologically efficient regional treatment grounds. The commission feels it essential to conduct extensive explanatory work among the public that these grounds built according to plans which have undergone state ecological impact assessment are nature-protective facilities and their location and operation have been planned for on the basis of engineering decisions which exclude the possibility of environmental pollution.

A decision was taken to return to a review of this question during the first quarter of 1991. The USSR Goskompriroda [State Committee for Environmental Protection], the USSR Ministry of Health, the USSR Gospromatomnadzor [State Committee for Safety in Industry and Atomic Power Industry] and the USSR Ministry of Geology have been instructed to strengthen control over the observance of the nature protection legislation for the disposal of toxic wastes and in discovering instances of their particularly dangerous impact on the environment as caused by flagrant violations of the current standards and rules, to submit the corresponding materials to the bodies of the USSR Procuracy.

The question was reviewed of expert evaluation of the machine-building products produced by the industrial enterprises for their conformity to the requirements of the environmental protection standards and rules.

The session of the Commission was chaired by the Deputy Chairman of the USSR Council of Ministers, V.Kh. Doguzhiyev.

USSR Procuracy Official Views Environmental Law Enforcement Issues*90WN0158A Moscow RABOCHAYA TRIBUNA
in Russian 5 Jun 90 p 1*

[Article by Leonid Kornilov, Moscow: "Shagreen Leather; 5 June—World Environmental Protection Day"]

[Text] We have long ceased to be shocked by a dead river, a fish floating belly up or the dried out tree trunks. Now we have been knitting our brows over a different matter: in shock therapy is there more of a shock or more therapy? The empty shelves concern us more than the devastating raid by civilization. We are not even concerned that the hour is approaching when suddenly the roar of political passions will die out and we will be completely indifferent to whom is elected to one or another post, women will forget their cosmetics, athletic records will be of interest to no one and children will not learn how to smile. This will happen when each of us realizes what monstrous record-breakers we have been in the area of self-destruction.

Can we really be someone who sees clearly just before death?! Some 100 million tons of harmful wastes! Some 22 km³ of untreated water!... This is the annual injection of poison which each year we put into the living space which we call our motherland. We, in essence, are burying ourselves, each year depositing in the earth some 100 billion tons of toxic and household waste. Over a million hectares of the territory of the Soviet Union has already been given up to the suicidal grounds, dumps and heaps and this lethal cemetery is growing and it is washed by the ground waters....

Don't drink water from wells! Don't drink water from the Volga! The Aral...Baykal...the Caspian...the Baltic...the Black Sea...the Ural...the Kuzbass...Chernobyl.... Are these the names of the living or are these the listing of the doomed? In our nation is there a real force capable of halting the ecological offensive against nature and man?

For an answer to this question I turned to the USSR Procuracy. Was it for an answer? No, of course not. Rather for support and for the search for protection. There certainly, I felt, at the highest levels of justice an ecological violation would be qualified as nothing more than a crime against man and possibly against mankind. And if the toxin was being beaten somewhere, had its alerting call reached the ears of the procurators? Certainly the strict judges know how to punish the guilty parties? How else to seek protection against radioactive rain if not by the law?

With good reason in the USSR Procuracy, they have established the Administration for Supervising the Execution of Nature Protective Legislation. This is headed by Anatoliy Sergeyevich Sugrobov. On my way to meet him, I was thinking that this man had an opportunity to

become the savior of the fatherland. Were there possibilities for this? Anatoliy Sergeyevich himself with frankness and bitterness recognized that....

The nation has enough monitoring and law enforcement bodies. But the results of their activities are extremely low. Because an assessment of their work has not been produced. Actually, how can one assess the activeness, for instance, of the USSR Goskompriroda [State Committee for Environmental Protection] or the sanitation-epidemiological stations or even the procuracy bodies? At present, we have in use few expressive numerical indicators: the number of protests, filings, initiated criminal cases.... But in the given instance we are not involved with an apartment thief. Take away his "jimmy" and escort him to those not so far off places and you should be able to live more calmly. But the situation is developing differently. Let us assume that we have removed the director of a smoke-producing plant and have shifted him to another place. But the plant continues to go on smoking. So we must not be lulled by paper reports on how much was paid in fines or how many held accountable. The plants must be closed down. As they say, God gave short horns to the butting cow: and the arms of the procuracy are also short. Why?

Because its duty in our nation is to supervise the fulfillment of legislation. And nothing more. Supervise execution, I emphasize, and not the activities of the supervised enterprises. This is the crux of the matter: the fewer supervisory functions for the procuracy the more nature protecting it becomes. It should actively intervene into organizing the work of the enterprises which pollute the environment. But it has no such right. And hence the administrators have no respect for the law. And hence, there is nothing to breathe in the residential blocks adjacent to the industrial zones.

On the conscience of the Astrakhan Gas Condensate Combine there are many inhuman actions. That is the only way to call them! Around a hundred persons were poisoned by a recent release of hydrogen sulfide. The enterprise is presently devouring, like some monster, the health of the people. It should be closed down, its output changed or a global reconstruction carried out at it. Possibly then it would obtain the right to exist. But the procuracy does not have the power to close it down. It only has the right to make such a proposal to the USSR Council of Ministers. And it did this. In response, it received a pro forma document rejecting the proposal to close down the gas condensate murderer.

"How is it that the official who signed this letter of reply is not criminally liable?" I asked Anatoliy Sergeyevich.

"No," he replied. "The Council of Ministers is beyond our reach. We are disarmed before it because the nation does not have any law on the protection of nature. We proposed a draft for approval by the USSR Supreme Soviet but it was turned down.

Was this because of a lack of timeliness? Clearly, the USSR Council of Ministers, in focusing its attention on

purely economic goals, to put it figuratively, is holding a gun to the temple of the present and future victims of ecological disasters. Poisoned bullets are flying toward those currently alive and those who have still not been born. From high loopholes beyond the reach of even the Union Procuracy completely innocent people are being swept away as the hostages of homegrown progress.

On paper things do not seem so bad. They have set up the USSR Goskompriroda. It has existed now for 2 years. But the problem is that it only exists because up to now they have not even defined the functional duties of the committee and there is no regulation.

Anatoliy Sergeyevich feels that again this is an oversight of the USSR Council of Ministers. Together with the CPSU Central Committee the Council on 7 January 1988 worked out a Decree "On a Fundamental Restructuring of the Protection of Nature in the Nation." According to the mentioned document, the USSR Goskompriroda should become what it should be. That is, certain ministries and departments would be obliged under this decree to turn over to it definite institutions, obligations and rights. But they are resisting and the Council of Ministers is not supervising the fulfillment of its decree. The departments have no fear of the law because there is no law itself. The instinct of self-preservation has clearly not hinted anything to them and it has merely atrophied behind the thick office walls. At the same time, the USSR Procuracy must be content with an article according to which a person guilty of polluting the environment can be charged at most a fine of 300 rubles. Blasphemous!

And what sense does it make to give data here on how many officials last year were held disciplinarily, administratively or materially liable because in their predominant majority they are all "small fry." Those who have real power are beyond the reach of the procuracy. Without beating around the bush, in the USSR there is no ban against the polluting of the environment. Moreover, looking at it from the economic aspect, it is more advantageous for the enterprise to pollute than it is to build treatment facilities.

In Yaroslavl Oblast the soviet did not want to tolerate the adventurism of the "polluters" anymore. Recently, a decision was passed there that all fines paid by the Yaroslavl enterprises would go to the local Council for the Protection of Nature and would then be used for the designing and construction of treatment facilities. But the fines are still by the "penny-ante" method. A radical approach for solving the problem is essential.

For example, A.S. Sugrobov imagines this as follows. The immediate approval by the USSR Supreme Soviet of a law for the protection of nature. And an obligatory large state subsidy for the USSR Procuracy to expand the personnel of the Directorate for Supervising the Execution of Nature Conservation Legislation. At present, in Sugrobov's administration there are only 309 persons.

These are basically legal workers. But they need specialists in the area of water utilization and specialists who know the technology for treating the air and soil. They, to put it figuratively, could become the "fangs" in the presently toothless system of nature-defending procuracies.

Such a one exists in the Greater Moscow Area. But even here, under the very wing of the Union Procuracy, the nature protecting subdivision does not possess the required prohibiting, let alone punitive force. A nature protecting procurator here cannot even oppose the expansion of the orchard and dacha societies. In the Greater Moscow Area there is the mass allocating of swamps and swampy forested waste plots for development. As a result, the threat has arisen of the disappearance of an enormous number of streams and small rivers. The supply of the large rivers can thereby be destroyed. Let us give a specific example.

The Storozhka River which flows near Zvenigorod empties into the Moskva River. It does for now. It rises in the upland swamp of Goreloye. In any corner of the world an upland swamp, that is, one fed by springs, means a taboo for human interference and is protected by international legislation. But in our nation the Odintsovo Gorispolkom lightheartedly turned over Goreloye to the Ikar dacha cooperative from the Vnukovo Production Association of the Ministry of Civil Aviation. The Goreloye swamp, incidentally, is among the places where the locating of garden plots has been prohibited by a special document signed by the deputy chairman of the Committee on the Questions of Ecology and the Rational Utilization of Labor Resources. Here we are confronted with ecological illiteracy and legal nihilism of the local authorities.

This example has been given to persuade others that as for ecology, on large and small matters we are acting with barbarism shortsightedness. Because our living space is inexorably shrinking like shagreen leather. We have been stealing from ourselves and we should be held responsible for this to future generations, because to an even greater degree we have stolen from them. We are confronted with an unprecedented theft of three dimensions—mineral resources, water and land. We must recognize, finally, that we are proceeding thoughtlessly and merit an immediate and strictest law for the protection of nature. Here lies our physical and moral salvation.

Goskompriroda Official Views Environmental Policies, Priorities

90WN0159A Moscow VETERAN in Russian No 24,
11-17 Jun 90 pp 10-11

[Interview with Doctor of Economic Sciences Nikolay Nikiforovich Lukyanchikov, chief of the Main Administration for the Economics and Organization of Nature

Management [Glavnoye upravleniye ekonomiki i organizatsii prirodopolzovaniya] under the USSR Goskompriroda by Correspondent A. Orlenko: "Let Us Defend Our Common House"]

[Text] [Orlenko] "The earth in strife!" "Ecology crisis!"—these are the voices most often heard when discussing nature. What is your assessment of the current situation?

[Lukyanichikov] You are right, almost every day we encounter information concerning acute ecological situations: the release of gases into the atmosphere, the falling of phenol into the water lines of a major city. Hence, our times require emergency measures to protect the environment. At present, civilization is beginning to degrade and this threatens the existence of life itself on earth. This has appeared in the trends for a global change in the climate, a reduction in the earth's ozone layer, and in the destruction of the integrity and the loss of individual regional ecosystems. One can learn in detail about all of this from the reports published in 1989 by the International Commission for the Environment and Development and entitled "Our Common Future" and that of the USSR Goskompriroda [State Committee for Environmental Protection] entitled "A National Report on the State of the Environment in the USSR."

The first problem is tied to a change in the climate. In line with the significant release into the atmosphere of the so-called "hothouse gases" (carbon dioxide, methane, Freon and so forth), the solar radiation is retained in the surface layers of the earth, causing a general warming. As a result, the surface temperature in the Northern Hemisphere has become 0.4 of a degree Celsius higher than in 1956-1980. If measures are not taken, it is expected that its rise will average 1.3 of a degree and by the year 2050 by 3 or 4 degrees. These seemingly insignificant anomalies are fraught with dangerous consequences. A temperature rise can lead to the thawing of the permanent ice and consequently to a rise in the level of the world's ocean and here many low-lying cities and river deltas will be inundated. The air currents in the atmosphere will change and this can also lead to unpredictable consequences.

In addition, an increase in droughts is expected in the arid and semiarid regions while increased precipitation is expected in the humid zones. Such a change in the climate can tell negatively on the production of agricultural products.

A particular concern is the fate of the earth's ozone layer. With a decline in it, harmful radiation will increase and this can cause skin cancer and reduce productivity in agriculture and the world's ocean.

Even now in Antarctica the ozone layer during the spring months drops by 40-50 percent. In 1988, the "ozone tear" spread into a populated region encompassing Melbourne, Perth, Hobart and Macquarie Island. A 10 percent decline in the ozone layer lasted a month here.

The further uncontrolled rise in the release of chlorofluorocarbons which destroy the ozone layer will lead to a situation whereby by the middle of the next century the ozone content in the middle latitudes of the Northern Hemisphere will decline by 4-8 percent, and in the polar regions of the Arctic and Antarctic by 12-15 percent. This will be a serious threat to human activity as a whole.

There has also been great concern over the destruction of the tropical forests in the world and the intensive growth of desertification and as a result of this the dried-out lands become economically unproductive.

Up to the present, one-half of the tropical forests has already been destroyed and with each passing year their area drops by 11 million hectares. Each year, around 6 million hectares are turned into desert.

[Orlenko] The picture, to put it frankly, is gloomy. How do you view the ecological situation in our nation?

[Lukyanichikov] As very tense. With good reason, the USSR Supreme Soviet in December 1989 adopted a decree "On Immediate Measures for the Ecological Amelioration of the Nation."

The release of polluting substances into the atmosphere is around 100 million tons a year. In 103 cities (with a total population of around 5 million persons), the concentration of pollutants in the atmosphere significantly exceeds the maximum permissible level according to the health standards. Water quality in more than one-half of the sources also does not meet the requirements of the sanitary and ecological standards.

The Aral Sea Basin and certain areas which have been subjected to radioactive contamination as a result of the accident at the Chernobyl Nuclear Power Plant have become ecological disaster zones. As you know, they plan to relocate thousands of inhabitants from a number of regions of Belorussia, the Ukraine and the RSFSR.

Also on the brink of an ecological crisis are Kalmykia, the Dnieper and Dniester regions, the Donbass, the Ural, Kuzbass, the basins of the Volga, Sevan, Issyk-Kul, Balkhash and Lake Ladoga, the Black, Azov, Caspian and Baltic Seas and a number of other regions.

The state of our land resources causes great concern. Everywhere we have noted the chemical contaminating of the soils, a decline in natural fertility and the degradation of the land because of erosion, salinization and a technogenic overload. As a result of erosion, each year around 1.5 million tons of fertile soil is lost. The drop in fertility is the main reason for the low return on our investments into agriculture.

More and more harmful substances are being taken into the human organism along with food products, drinking water (for example, Bashkiria) and the air. As a consequence of this, there has been a rising morbidity of the population and an increase in the number of children

with inherited defects. In recent years, a new category of persons has even appeared called the "ecological refugees."

The anthropogenic effect is felt particularly strongly on the populations of the rare species of the animal world. For example, over the last 10-20 years, the Turanian tiger, the cheetah, the leopard racer snake, the Aral elk as well as over 10 species of higher plants have disappeared in our nation. In 1984, the USSR Red Book contained 463 species of animals and 684 species of plants. Natural fish productivity has declined significantly and hence the catches of the valuable species of commercial fishes from the inland seas and waters. Thus, over the last 50 years, in the Azov Sea, these have declined by almost 20-fold and in the Caspian Sea Basin by 6-fold.

In the nation there is a very high expenditure of primary natural raw material per unit of end product. Ending up on the dumps are over 50 billion tons of wastes and a portion of these could be efficiently used in the national economy but.... As it seems to me, a further advance of our economy along such a wasteful path is simply inadmissible if only because it is incompatible with the protection of nature.

Serious ecological danger threatens all. It is important to instill ecological culture in all strata of society in order to arouse each person to action for the sake of saving our common home, the earth. I feel that our veterans can also find their place in this movement.

Recently, your weekly (No 51, 1989) published sharp material on ecology entitled "What the Amur Waves Are Whispering?" For Goskompriroda this article was an alert to include the Amur Region in the list of zones with a tense ecological situation. It is a good thing that the weekly intends to organize a social movement to save the nature in the Amur River Basin with the most active participation being assigned to the veterans. Certainly we who live today should give some thought to tomorrow and hence to the future of our children and grandchildren and what we are leaving after ourselves on the earth.

[Orlenko] Nikolay Nikiforovich, what ways are there for a comprehensive solution to the ecology problems in our nation?

[Lukyanchikov] I feel that the basis of this can and should be a long-term state plan for the protection of environment and the rational utilization of natural resources for the 13th Five-Year Plan and for the long run up to the year 2005. Its elaboration is now being concluded and the result of implementation should be the gradual achieving in 1991-2005, as the scientists say, of the normed environmental quality, that is, scientifically based indicators for the utilization of natural resources.

In order to carry out the program, during each five-year plan we must increase by approximately 3-4-fold the volume of investments into protecting nature. It will be

hard to find this money but it will be impossible to improve the ecological situation in the nation without radical measures. Hence this money must be found. One of the possibilities is the converting of the defense industry as well as restructuring the national economy on the basis of resource-saving and integrated waste-free production. Without saving resources it is impossible to solve not only the ecological problems but also social ones. And certainly economic methods of nature management should also be given a major role.

[Orlenko] What do these consist of?

[Lukyanchikov] In the first place, for the territories and ecosystems we must set limitations within which the productive forces should be allowed to develop and be located.

As such restrictions there should be:

- Limits on the release (discharge) of pollutants into the environment by territories, enterprises and individual ecosystems;
- Limits for the maximum permissible removal of natural resources from the individual ecosystems.

The first type of restriction assumes an annual decline in the discharges and ultimately the bringing of these to a standard level. Then nature would be able to urge itself.

The second type of restriction concerns the maximum permissible removal of natural resources. The aim here is to observe an equilibrium in one or another ecosystem and not allow it to be destroyed. From the example of the Aral Sea we can see what such destruction leads to.

In order that something similar happens nowhere else, it is essential to set ecologically sound limits on the removal of water from the river basins. Even now, for example, the ecosystems of the Azov Sea have been brought to their lower limit.

From this it follows that any intervention into nature should not lead to the violating of the established ecological limitations.

If, for instance, new construction in the future will lead to the increased discharge (release) of pollutants on one or another territory, then we must provide for a decline in the discharges at the operating enterprises so that an ecological equilibrium is maintained for the entire region.

We are placing great hopes on the veterans and on the informal organizations of the Greens who, from our viewpoint, could watch this and prevent a deteriorating of the ecological situation in their region.

But, in addition to the designated restrictions, with large-scale interference into nature, we must consider without fail the possible consequences and they, as practice shows, can be the most unexpected. For example, it is known that as a result of the construction

of the Krasnoyarsk GES, below its dam the Yenisey River does not freeze in the winter even in the hardest cold. During frosts, thick fogs hang over the water surface and these, like a sponge, absorb harmful substances from the polluted air. With temperature changes over Krasnoyarsk, an aerosol "cap" is formed and this contains a significant amount of particularly toxic elements which easily penetrate into the human organism through the respiratory tracts.

The construction of the GES on the Volga has had a different impact. Before the appearance of the dam, water traveled from Rybinsk to Volgograd in 50 days (in flooding in 20 days) but now in a half year. Water exchange in the basin has declined by 12-fold! As a result of evaporation from the reservoir of the Volga-Kama series of GES, descending cold air currents from the atmosphere are formed. This in turn delays the start of the growing season of the plants by 10-30 days and contributes to the development of drought to some 10-30 km away from the shoreline.

Stagnation phenomena in the basin of the great Russian river have led to the degradation of the Volga as a unified ecological system.

But can we allow ourselves to lose the Volga? There is only one answer: no we can't! This is why for saving the river and preserving nature in the Caspian Sea Basin, the USSR Goskompriroda is preparing the draft of a special decree of the CPSU Central Committee and the USSR Council of Ministers. The Social Committee for the Saving of the Volga is also active.

The goals of the long-term program mentioned here should be incorporated in the plan for the social and economic development of both the nation, the republic, as well as the individual regions and enterprises.

If for some reason they are not incorporated in the 13th Five-Year Plan, this will be an enormous blow to the environment and beyond comparison with any previous disasters.

[Orlenko] You have mentioned establishing a payment for the use of nature. Would you describe this in greater detail?

[Lukyanichikov] In many regions of the nation, as an economic experiment for the industrial enterprises they have introduced a payment for environmental pollution. This is set for the discharge (release) of pollutants into the air and water and for the dumping of solid wastes. The source of this payment is enterprise profit and with above-standard pollution the net income of this enterprise's collective. From 1991, such payments will be introduced everywhere. This will make it possible first of all to employ the internal reserves of the plants, factories and kolkhozes for reducing environmental pollution. And these reserves, as analysis indicates are enormous. According to an expert evaluation, merely by bringing environmental equipment to a normal state and

increasing production efficiency it is possible to reduce the release (discharge) of pollutants into nature by 20-25 percent!

A payment for natural resources will be introduced simultaneously with the reform in wholesale and purchasing prices. Certain types of payments have already been introduced. Pollution penalties as well as fines for the irrational use of resources and for violating conservation legislation will be used for the betterment of the rivers, seas, forests, the tundra, arable lands and so forth.

[Orlenko] Certainly not only a system of payments and penalties but also a system of encouragement should be set up for encouraging conservation?

[Lukyanichikov] Certainly. In our opinion, we should introduce easy crediting conditions for the conservation activities of the enterprises and organizations and set tax benefits for increasing the wage fund for enterprises which build treatment facilities and which carry out the reconstruction and repair of conservation facilities. There should also be the establishing of other benefits depending upon the ecological purity of production.

[Orlenko] Nikolay Nikiforovich, what is your attitude toward international collaboration in solving ecological problems?

[Lukyanichikov] As a very important factor. Alone now, we cannot save ourselves from ecological disaster. The basic goal of such collaboration should be to establish a favorable "economic climate" for the sake of protecting nature. For this we should sharply increase the pace of technical progress in all countries of the world. The exchange of advanced technologies, preferential crediting and other mutually advantageous agreements should become the law. Probably we should set up an international fund for the protection of nature. A portion of the money for this fund (on the basis of mutual agreement between countries) could come from the conversion of defense production.

[Orlenko] One last thing. What must be done for the protection and reproduction of the plant and animal world?

[Lukyanichikov] You obviously have in mind the protection of typical and rare landscapes in a natural state, saving the genetic pool of wild plants and animals and improving the quality of the environment. It is essential first of all to broaden the network of reserves, preserves and national parks and monuments of nature. The total number of reserves and reserve hunting farms in the USSR at the beginning of 1989 reached 164 and the area occupied by them some 216 million hectares. However, these do not cover all the climatic zones of the nation and their territories protect only 39 percent of the species of mammals, 55 percent of the bird species and 68 percent of the reptile species. Under the condition of intense economic activity this does not guarantee the preservation of the entire diversity of wild animal and plant species.

We should also protect against anthropogenic impact the territories which are of particular cultural and historical importance, for example, Yasnaya Polyana, Mikhaylovskoye, Melikhovo and many others.

There must be a special attitude also for the "ethnic territories" which require unstinting conditions of nature management and ensuring the preservation of the national culture and way of life of the small peoples and nationalities in the areas of their historical dwelling.

In a word, in everything we should endeavor for harmony, for creating for the sake of the future of our earth and man as the main value of nature and society.

State Environmental Protection Construction Funding Statistics

90WN0173A Moscow VESTNIK STATISTIKI
in Russian No 6, Jun 90 pp 39-43

["1989 Environmental Protection Construction Projects"]

[Text] In 1989 3.8 billion rubles in state capital investments were directed toward environmental protection and rational use of natural resources, which is 21 percent more than in 1988; 3.3 billion rubles were actually used, or 4.0 percent more. Capital investments for environmental protection construction amounted to less than 2.0 percent of the total volume of investments in the national economy. In the USA this proportion is nearly 1.5 times greater.

In 1989, as in years past, ministries, departments, and union republic Councils of Ministers did not devote proper attention to environmental protection construction, although the ecological situation in a number of regions remains extremely tense. Failure to carry out tasks for erection of environmental protection projects and increasingly severe reaction of public opinion to shortcomings in protecting the environment have led to a situation in which, in a number of regions in the country, the operation of over 1,000 enterprises and individual factories was halted by decision of local authorities.

Capital investments allocated for the year were only 86 percent utilized. Of the total volume of capital investments assimilated for environmental protection purposes, 1.1 billion rubles, or a third, consisted of the enterprises' and organizations' own assets; moreover, these assets were utilized at a lower level (82 percent) than the centralized funds (88 percent).

The state order for putting the most important environmental protection projects into operation in 1989 was spoiled: out of 150 projects, only 74 were put into operation.

Two point two billion rubles in state capital investments were used for protection and rational use of water resources, or 85 percent of the ceiling.

With the significant increase in the volume of contaminated waste water dumped into the nation's water reservoirs each year, the task for putting into operation facilities for treating effluent was only half-fulfilled. Facilities capable of treating 4,352 cubic meters of water per day were put into operation, which is 16 percent less than in 1988. Introduction of highly-efficient inter-branch common-system installations for waste water purification using valuable components and sediment deposition was not introduced at USSR Minmetallurgiya's Chiaturmarganets Metallurgical Combine, at the USSR Minkhimnefteprom's [Ministry of Chemical and Oil Engineering] plastics plant in Nizhnii Tagil, and also USSR Minugleprom's [Ministry of the Coal Industry] plants at Prokopevsk and Mezhdurechensk in Kemerovo Oblast; and at the housing and municipal services facilities of the cities of Kostroma, Magadan, Ivano-Frankovsk and Ashkhabad. The aforementioned projects are situated on the whole in regions where the pollution of water resources with toxic substances significantly exceeds the allowable sanitary norms.

Putting into operation water-recycling systems, which provide for economizing on fresh water and reducing the discharge of polluted wastes, increased in comparison with 1988. At the same time, the annual task for introducing these systems has been carried out by only 52 percent. Systems such as this, with a 24-hour capacity of 14.8 million cubic meters, were not put into operation. USSR Minenergo failed to introduce a 5.3-million cubic meters-per-day water-recycling system, and USSR Minatomenergoprom, whose enterprises are the primary water-users in industry, failed to introduce a 7.3-million cubic-meters-per-day system. The task to introduce a conservation-intensive (closed) water supply system at Mosenergo's TETS-8, Tyumen's TETS-2, Tbilisi's GRES, and Rostov's AES, was frustrated.

In 1989, 404 million rubles in capital investments were utilized for construction projects to ensure the protection of the atmosphere, the annual ceiling for which was 76 percent assimilated. Installations were put into operation for regulating and removing harmful substances from exhaust gases expelled at a rate of 31.2 million cubic meters of gas per hour, or 56 percent of the annual task. At the same time discharge of harmful elements into the air from stationary sources is still great, although it has declined somewhat in comparison with the preceding year.

Of the overall discharge of harmful elements, the greater proportion falls to enterprises of the USSR Minenergo [Ministry of Power Engineering] (25 percent), Minmetallurgiya (26 percent) and Minkhimnefteprom (7 percent). At the same time USSR Minenergo did not ensure putting into operation gas-treatment installations capable of treating 8.6 million cubic meters of gas per hour (57 percent of the task), USSR Minmetallurgiya—3.5 million cubic meters of gas per hour (28 percent), and USSR Minkhimnefteprom—0.6 million cubic meters of gas per hour (31 percent). These ministries frustrated the plan for introducing such installations at enterprises in a

number of cities, were an especially high level of air pollution is noted: at Krasnoyarsk TETs-3 and Irkutsk TETs-7, at the Donetsk metallurgical plant, at the Severodonetsk Stekloplastik Production Association, at the regional boiler works in Bratsk, and at the Magnitogorsk Metallurgical Combine.

In 1989 140 million rubles in state capital investments (86 percent of the ceiling) was spent for preservation and rational use of mineral resources. Of the 10 structures and installations planned for comprehensive use of mineral resources, only 4 were put into operation. Because of the insufficient support by such installations, significant losses of valuable minerals continue during the refinement process, and valuable by-products are lost during the extraction and refinement of gases. The total amount of minerals lost during the extraction and refinement process amounts to about 7 billion rubles. Every year up to 20-25 percent of petroleum gas by-products are burned up, the loss of which is valued at 70-100 million rubles.

Fifty-two million rubles in capital investments (83 percent of the task) were utilized for measures to preserve forest resources and fish reserves.

The situation with respect to measures taken for preservation and rational use of the land is somewhat better. For these ends, 441 million rubles in capital investments, or 104 percent of the ceiling, were assimilated. Of this amount, 229 million rubles, or 100.7 percent, were spent for construction of anti-erosion hydraulic engineering, flood-control, anti-landslide and other installations (including bank-shorings). By virtue of state capital investments, protective forest strips were established on 31,100 hectares (93 percent of the task), and work carried out on terracing steep slopes encompassing 800 hectares (96 percent).

The situation that took shape in 1989 with respect to use of capital investments allocated for environmental protection purposes and for putting into operation environmental protection projects requires fundamental changes in attitude toward such construction by the ministries, departments and councils of ministers of the union republic, in order to significantly improve the ecological situation in the country.

State Capital Investments for Environmental Protection and Rational Use of Natural Resources for 1989.
(Millions of Rubles)

Capital Investments—in all	Including for Protection and Rational Use		Water Resources		Atmospheric Air		Land		Mineral Resources	
	Used	Percent of Ceiling Used	Used	Percent of Ceiling Used	Used	Percent of Ceiling Used	Used	Percent of Ceiling Used	Used	Percent of Ceiling Used
USSR Total	3255	86	2166	85	404	76	441	104	140	87
Fuel-Energy Complex	597	93	328	92	103	83	97	123	53	85
USSR Minenergo	123	94	95	95	19	82	1	196	-	-
USSR Minatomenergoprom	87	109	84	108	2	97	0.3	172	-	-
USSR Minneftegazprom	159	101	57	93	33	86	69	118	-	-
"Gazprom" Concern	166	86	39	79	49	81	24	142	46	81
USSR Minugleprom	48	80	39	75	-	-	2	99	7	117
USSR Minneftegazstroy	14	85	14	86	-	-	0.5	75	-	-
Metallurgical Complex	403	86	220	89	115	78	6	102	59	94
USSR Minmetallurgiya	360	83	181	111	77	6	105	59	94	

State Capital Investments for Environmental Protection and Rational Use of Natural Resources for 1989.
(Millions of Rubles) (Continued)

Capital Investments—in all	Including for Protection and Rational Use		Water Resources		Atmospheric Air		Land		Mineral Resources	
	Used	Percent of Ceiling Used	Used	Percent of Ceiling Used	Used	Percent of Ceiling Used	Used	Percent of Ceiling Used	Used	Percent of Ceiling Used
"Norilskiy Nikel" Concern	43	133	39	135	4	116	0.0	2	-	-
Machine-Building Complex	109	77	93	13	78	2	192	-	-	-
USSR Mintyazhmash	26	74	21	72	5	78	0.4	100	-	-
USSR Minelektro- tekhpribor	21	82	19	83	1	53	0.1	89	-	-
USSR Min- stanko- prom	6	68	5	65	1	92	0.01	100	-	-
USSR Minav- toselkhoz- mash	54	78	46	76	6	92	2	103	-	-
Khimiko- lesnoy Kompleks	522	75	317	78	132	68	19	24	78	-
USSR Minkhim- nefteprom	181	68	112	72	56	58	4	73	8	108
"Agrokhim" Association	178	86	93	91	37	71	14	102	14	72
USSR Minmed- prom	43	75	36	72	7	93	0.3	79	-	-
USSR Minlesprom	112	74	70	74	32	85	1	65	-	-
"Tekhnokhim" MGO	8	88	6	116	-	-	-	-	2	54
Union Republic Councils of Ministers: RSFSR	504	85	374	82	6	79	110	97	-	-
Ukrainian SSR	233	93	141	91	2	78	81	102	-	-
Belorussian SSR	30	88	25	87	2	74	3	109	-	-
Uzbek SSR	59	94	34	79	0.4	76	22	136	-	-
Kazakh SSR	85	126	78	130	0.4	75	3	91	-	-
Georgian SSR	40	95	16	91	-	-	12	98	-	-

State Capital Investments for Environmental Protection and Rational Use of Natural Resources for 1989.
(Millions of Rubles) (Continued)

Capital Investments—in all	Including for Protection and Rational Use		Water Resources		Atmospheric Air		Land		Mineral Resources	
	Used	Percent of Ceiling Used	Used	Percent of Ceiling Used	Used	Percent of Ceiling Used	Used	Percent of Ceiling Used	Used	Percent of Ceiling Used
Azerbaijan SSR	20	64	15	66	0.3	66	5	60	-	-
Lithuanian SSR	36	91	34	90	0.1	100	2	-	-	-
Moldavian SSR	42	74	18	65	0.1	17	23	93	-	-
Latvian SSR	30	92	30	92	-	-	0.02	107	-	-
Kirghiz SSR	10	77	7	69	-	-	3	106	-	-
Tajik SSR	21	89	5	51	-	-	15	119	-	-
Armenian SSR	11	49	11	53	-	-	-	-	-	-
Turkmen SSR	7	75	5	71	0.1	53	2	191	-	-
Estonian SSR	23	87	22	90	0.4	43	1	65	-	-

Environmental Protection Projects Put Into Operation Through State Capital Investments in 1989

Introduced	Works for Effluent Treatment, thous. met. ³ per Day		Water Supply Recycling Systems, thous. met. ³ per Day		Installations for Trapping and Neutralizing Harmful Elements from Gas Discharges, thous. met. ³ of gas per hour	
	Percent of Plan Fulfilled	Introduced	Percent of Plan Fulfilled	Introduced	Percent of Plan Fulfilled	
USSR as a Whole	4352	50	15897	52	32111	56
<i>Fuel-Energy Complex</i>	398	47	19736	46	7865	33
USSR Minenergo	108	52	1519	22	6529	43
USSR Minatomenergo-prom						
USSR Minneftegazprom	120	49	8	19	63	100
"Gazprom" Concern	38	104	15	-	64	100
USSR Minugle-prom	102	40	5	59	-	-
<i>Metallurgical Complex (USSR Minmetallurgiya)</i>	856	92	795	42	9089	72
<i>Machine-building Complex</i>	324	33	441	84	3994	66
USSR Mintyazhmash	119	72	101	100	2237	67
USSR Minelektrotekhpribor	38	48	299	96	8	6
USSR Minstankoprom	42	65	0.2	2	471	50

Environmental Protection Projects Put Into Operation Through State Capital Investments in 1989 (Continued)						
	Works for Effluent Treatment, thous. met. ³ per Day		Water Supply Recycling Systems, thous. met. ³ per Day		Installations for Trapping and Neutralizing Harmful Elements from Gas Discharges, thous. met. ³ of gas per hour	
Introduced	Percent of Plan Fulfilled	Introduced	Percent of Plan Fulfilled	Introduced	Percent of Plan Fulfilled	
USSR Minavtosekhomash Tc125	19	33	35	1278	81	
Chemical-For-estry Complex	408	56	2670	79	2584	62
USSR Minkhim-nefteprom	125	54	238	37	1336	69
Agrokhim Association	186	72	1805	74	423	95
USSR Minmed-prom	22	21	415	91	817	73
USSR Minlesprom	75	55	212	81	8	1
Union Republic Councils of Ministers:						
RSFSR	773	48	19	892	49	
Ukrainian SSR	404	71	20	111	825	82
Belorussian SSR	25	70	16	100	443	72
Uzbek SSR	93	94	600	100	10	97
Kazakh SSR	305	62	3	100	-	-
Georgian SSR	0.8	2	-	0	-	-
Azerbaijan SSR	0.1	0.02	-	-	-	-
Lithuanian SSR	18	100	0.4	47	83	100
Moldavian SSR	24	40	0.3	1	-	-
Latvian SSR	9	42	0.3	31	-	-
Kirghiz SSR	0.4	0.3	-	0	-	-
Tajik SSR	4	18	-	0	-	-
Armenian SSR	89	79	-	-	-	-
Turkmen SSR	-	0	-	-	-	-
Estonian SSR	2	2	-	-	-	0

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1989 Sewage Treatment Effectiveness Data
90WN0173B Moscow VESTNIK STATISTIKI
in Russian No 6, Jun 90 pp 43-44

[Unattributed report: "On the Operation of Sewage Treatment Plants"]

[Text] In 1989 USSR Goskomstat jointly organized with USSR Goskompriroda [State Environmental Protection Committee] the conduct of a one-time selective investigation into the operating effectiveness of sewage treatment plants in connection with the discharge of effluent into the surface water supply, and summarized the data derived.

In all the study embraced about 500 major industrial enterprises, and municipal organizations in cities, with over 700 sewage treatment plants.

Among the factors determining the ineffective operation of sewage treatment facilities, enterprises and organizations, was the increased workload as compared with the designed norms for the volume and nature of the effluents coming in for purification (24 and 31 percent of the respective plants inspected); the physical and moral wear, including technical imperfections in the treatment plants (21 and 20 percent); the lack of or the disconnection of the appropriate equipment (10 percent); the conduct of start-up and adjustment work (7 percent); and the lack of reagents and materials for purifying the effluent (2 percent). At the same time a significant number of enterprises indicated two and more reasons for their ineffective sewage treatment operation.

Overloaded to the greatest extent are the sewage treatment plants of enterprises in the medical, microbiology, coal, light industry, lumber and cellulose, oil-refining and petro-chemical industries and a number of other branches. In the housing and municipal-services economy a most unfavorable situation exists because of overloading sewage treatment plants came to pass in Tajikistan, Belorussia, the Ukraine, Latvia, Lithuania, and a number of other union republics.

At the present time a significant number of sewage treatment plants have been operating for a long period (20 years and more). The norms for treatment of effluents employed during the designing of these facilities

quite often do not correspond with contemporary environmental protection requirements, nor with the actual pollution of the water reservoirs into which the waters are drained. In this connection, in order to characterize the quality (the degree of purification) of effluents discharged, the indicator of maximum allowable discharge (PDS) is used, which is calculated in consideration of contemporary ecological requirements for specific water reservoirs.

The results of the investigation have shown that, whereas the operating effectiveness of existing water-conservation installations with respect to their design characteristics amounts to 59 percent, only one-third of the effluents are reduced to the maximum allowable discharge.

Observation of Design Characteristics in Operation of Sewage Treatment Plants (According to Results of Selective Investigation)

	Actual Amount of Effluent Passing Through Treatment Facility (during the period of investigation), thousands of meters ³		
	In All	Including that brought to the level of treatment stipulated in the design characteristics	Proportion of effluents brought to designed level of treatment to the total volume of effluents passing through the treatment facilities, in percentage
USSR	43485	25807	59
Including for enterprises of:			
Housing and Municipal Services	20779	16336	79
Industry	22705	9471	42
Of these:			
Power Engineering	354	200	56
Oil Refining and Petrochemical Industry	1665	915	55
Coal Industry	6617	750	11
Ferrous Metallurgy	3884	2884	74
Nonferrous Metallurgy	675	322	48
For Mineral Fertilizer Production	1318	815	62
Chemical Industry	1303	805	62
Motor Vehicle and Agricultural Machine Building	181	132	73
Lumber and Pulp-and-Paper Industry	5479	2106	38
Light Industry	131	37	29
Medical and Microbiology Industry	234	16	7
Agroindustrial Complex	110	63	57

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Goskompriroda Chairman Comments on Hazards From Syrian Chemical Imports

90WN0192A Moscow IZVESTIYA in Russian
21 Jun 90 Morning Edition p 4

[Article by N. Vorontsov, chairman of Goskompriroda: "Oranges Instead of Phosphorites"]

[Text] The USSR Goskompriroda [State Committee for Environmental Protection] has conducted a second eco-

logical expert evaluation of the plans to build a facility in Bryansk for processing Syrian phosphorites. Here is what our correspondent was told by the chairman of the Goskompriroda about this:

"As is known, by the time of our impact assessment, the ecological impact assessment of the RSFSR Goskompriroda had voiced a negative opinion on the question of the plans. However, representatives of the Agrokhim [Agrochemical] Association did not agree with the opinion of the experts. The USSR government instructed us to conduct a new ecological study.

"In such a situation it was very important to provide an assessment of the project which would not cause any doubts among the different parties. Just how balanced was the final decision can be seen from the fact that even after the conclusion by our expert commission, a decision was taken to consult again with different scientific research institutes and centers. The additional information supplied by the specialists was completely persuasive as to the correctness of the conclusions by both Goskompriroda expert evaluations: the Syrian phosphorites in the form in which they are delivered to our nation are ecologically dangerous. In addition, one must consider the socioecological tension in Bryansk Oblast the population of which has suffered from the Chernobyl disaster. Goskompriroda feels that the construction of the facility could intensify this tension.

"The danger of the offered phosphorites is not so much in the increased level of the concentration of radionuclides, as many feel, as it is in the fact that with their "aid," the soil is polluted with a number of heavy metals as well as fluorine and strontium. This can lead to the build-up of harmful elements in the agricultural products and to the polluting of the ground water. Both the radionuclides as well as the heavy metals are classified as mutagens which increase the frequency of the cancer rate and to the appearance of hereditary illnesses. Such a conclusion was also drawn at the Institute of General Genetics under the USSR Academy of Sciences imeni N.I. Vavilov and at the All-Union Oncological Scientific Center.

"There is also a great danger from the phosphorite dust. Under the conclusion of the Medical-Genetic Center of the USSR AMN [Academy of Medical Sciences], with the release into the atmosphere of dust having a complex chemical composition, particularly with volley releases, one can note a carcinogenic and mutagenic effect on man. Specialists from the Tayfun NPO [Scientific-Production Association] of the USSR Goskomgidromet [State Committee of Hydrometeorology] have also warned of the possible fluorine pollution of the zone adjacent to the plant. Within a radius of several kilometers, plants in just one season can pick up the maximum permissible concentration of this element.

"Thus, the danger of the Syrian phosphorites for the health of man and the environment has been shown by numerous specialists. But there are also other arguments against their importing. Phosphorite meal is effective only on acid soils. However, due to the extensive liming, there are fewer and fewer such lands. This was mentioned in the conclusions of the Institute of Plant Physiology imeni K.A. Timiryazev and the Institute of Soil Science and Photosynthesis of the USSR Academy of Sciences.

"In a number of Western European nations, phosphorite raw material is employed to obtain universal phospho-

rous-containing fertilizers. I feel that we should follow the same path, using the already existing production capacity. Incidentally, abroad they willingly purchase our phosphorites which are ecologically purer than the Syrian. Would it not be better for us to use these materials ourselves while Syria could repay the credits from our nation in something better for human health, perhaps citrus?

"In reflecting on the result of the expert evaluation, one involuntarily wonders about the level of our farming. For instance, is the desire to constantly increase mineral fertilizer production valid? According to the data of certain experts, last year the nation produced almost double the amount than in the United States. But the end result? Far from in our favor.

"I feel that it is essential first of all to utilize more efficiently the available fertile soil. Over a year we lose 3-fold more valuable humus than mineral fertilizers are applied. The annual losses from soil erosion reach 15-16 billion rubles. We have not done enough to introduce contour farming, dry reclamation, the reforesting of ravines and other methods of rational farming. Due to bad plowing (along and not across the slope), a tractor operator in a single season is capable of destroying the fertile soil layer the formation of which required decades and sometimes even centuries.

"Undoubtedly, questions will arise: Why has so much time and money been spent to prove what has already been proven? And how in the future will we organize our relations with the republic committees in such instances? In the given case, our committee carried out the government assignment, it conducted an expert evaluation of a plan which involved both interrepublic as well as international interests.

"But as a whole we are in favor of sharing functions. Those plans and ecological problems which do not go beyond the limits of a republic should be studied on the spot. I feel that with an increase in the economic independence of the republics, the sharing of our functions will be more noticeable. The USSR expert evaluations will be responsible for reviewing interrepublic problems and conflicts as well as assessing international plans and technologies from the viewpoint of ecological safety."

Editorial Urges Republic Oversight of Pesticide, Agrochemical Use

*90WN0188A Moscow ZASHCHITA RASTENIY
in Russian No 6, Jun 90 pp 3-4*

[Editorial: "Ecology and Pesticides: Emergency Situation"]

[Text] Late in March of this year the USSR Supreme Soviet's Committee on Questions of the Ecology and the Efficient Use of Natural Resources conducted parliamentary hearings on "Measures to Protect the USSR

Population Against the Detrimental Effect of Pesticides and Nitrates When They Are Used in Agriculture." The deputies listened to statements made by administrators of the USSR Council of Ministers State Commission on Food Products and Purchases; the Agrokhim State Association; USSR Minzdrav [Ministry of Health]; GKNT [State Committee for Science and Technology]; USSR Goskompriroda [State Committee for Environmental Protection]; VASKhNIL [All-Union Academy of Agricultural Sciences imeni V. I. Lenin]; specialists, scientists, and experts.

The speakers stated that the protection of the population's health and the environment against chemicals must be carried out at the state level. A. Kondrusev, USSR Chief Sanitation Physician, emphasized, "The situation should be viewed as an emergency one!" In recent years there has been an increase in the rate to which food products are contaminated by pesticides and nitrates, and as a consequence of this the disease-rate curve is climbing. This especially pertains to Moldavia, Central Asia, and the trans-Caucasus. One of the main reasons for this dangerous phenomenon is the inefficient use of chemicals, the violation of the rules for applying, storing, and transporting them, and the limited and obsolete assortment of pesticides.

The underestimation of the agrotechnical and other safe methods of protecting plants and the broad use of chemicals have contributed to raising the resistance that harmful species have to pesticides and to increasing the pollution of the environment. As a result, the frequency of detecting residual quantities of chemicals in food products has doubled or tripled in recent years!

Those who spoke at the parliamentary hearings noted that at the present time the producer bears practically no economic or legal responsibility for the quality of the output being delivered to the public. Billions of rubles are being invested in chemicalization, but the damage from the incorrect use of pesticides and fertilizers is much greater.

No one at the parliamentary hearings called for the complete rejection of chemicalization means. It is impossible to get along without them nowadays. But it is necessary to enact the appropriate laws. Some of them have already been prepared, and others will have to be developed within the shortest period of time. USSR people's deputies expressed the opinion that most of the questions that have come to a head can be resolved right now. A special program has been prepared.

Yes, the problems in the protection of plants have accumulated. Many scientists and specialists link the unfavorable situation that has been created with the imperfection of the existing organizational forms of the state's protection service that became part of the Soyuzselkhozkhimiya All-Union Association.

This, for example, is what USSR People's Deputy B. Satin writes. After the formation of the Selkhozkhimiya Association, the plant-protection services lost their

status and became a departmental organization whose basic functions were determined by Selkhozkhimiya and were directed at increasing the volumes of pesticide use. The scientists' observations attest to the fact that the unskillful use of chemistry has led to a situation in which the resistance of many harmful organisms to pesticides and the expenditure of the latter have increased by a factor of many times, at the same time that the harvest losses have not decreased, but, on the contrary, have frequently shown a tendency to increase. In the developed countries of the world, the plant-protection service is an independent state organization. B. Satin emphasizes that the interests of the job at hand demand that it be separated from the agrochemical service and be given the status of an independent state organization under the USSR Council of Ministers State Commission for Food Products and Purchases, like the veterinary service.

VASKhNIL also proposes giving the state plant-protection service the status of an independent organization that is part of the USSR Council of Ministers State Commission for Food Products and Purchases, with its own network in the republics, krais, and oblasts by analogy with the veterinary service, and proposes giving it the name "USSR Phytosanitation Service" and providing the organization of a viable intrafarm phytosanitation service on kolkhozes and sovkhozes.

This is what Professor G. Medvedev, president of the All-Union Entomological Society [VEO], writes. The participants in the 10th VEO Congress are concerned about the progressively worsening state of the service to provide protection to agricultural plants and forests in our country. In the developed capitalist countries, increasingly strict requirements are being made on controlling the use of pesticides: monitoring (the supervision of the phytosanitation condition and the need to employ protective means) has been introduced, as well as rigid control to check pesticide residues in food products, the soil, and water sources; to an increasingly broad extent, chemical methods are being replaced by alternative ones—agrotechnical, biological, genetic, and physical; and there has been a high volume of growing varieties that are resistant to pests and diseases. Our country's plant-protection service has been converted into a departmental organization, and its basic functions have been subordinated to increasing the volume of pesticide use.

The VEO president notes that, for various reasons, the plant-protection service has lost almost two-thirds of its specialists with higher specialized education. The positions of plant physicians exist on an insignificant number of farms, and among those working in this speciality, no more than 10 percent are certified specialists. Numerous recommendations by production workers and scientists concerning the fundamental improvement of plant protection in the country have not been finding support. As a result of what has been stated, it is proposed to separate the plant-protection service from the agrochemical service and to give it the status of

an independent state organization under the USSR Council of Ministers State Commission for Food Products and Procurements.

Professor G. V. Gegenava is also upset by the situation that has been created in the service. In his letter to the editor, he asks, "Are we really to believe that our colleagues who are specialists in plant protection, and primarily the editorial office of ZASHCHITA RAS-TENIY magazine, which is the sole regulatory printed organ that serves this branch of science and production, will not raise a voice of protest?"

My dear Grigoriy Vlasovich, they are raising their voice! This is also attested to by the mail received by the magazine and by the items published in the central press. An article that is remarkable in this regard is the one written by VASKhNIL Academician P. Susidko, entitled "Protectionless Protection," which was published in SELSKAYA ZHIZN newspaper under the rubric "It Demands Decision." Here are a few excerpts from the article: "The fate of the plant-protection service in our country is much-suffering. There have been alternative peaks and valleys, and finally it has reached the point, one might say, of its complete disintegration," the author writes... "And yet, almost one-third of the agricultural output in our country is annually 'eaten up' by diseases and pests, and the sowings are sometimes greatly suppressed by weeds... Plant protection is a matter of extraordinary importance... The forced use of chemicals that create ecological and social danger can be weakened only by assimilating integrated systems... In 1979 the plant-protection service was subordinated to the Soyuzselkhozkhimiya Association and its administrators, as well as administrators of many subdivisions of agriculture, viewed the resolution of the problem of protection specifically in chemicalization... The payment for the mistakes has been the sharp worsening of the phytosanitation condition of the sowings and plantings."

The scientist recommends taking steps immediately to take the "protectors" out from under subordination to Selkhozkhimiya at all levels—in the republics, oblasts, and rayons—and to reinforce the Green Cross farm services, and to organize a chief state inspectorate in this branch. This will make it possible in his opinion, to increase the ecological content of plant protection, as well as the effectiveness and competency of the management of the activities of the important and specific branch of agricultural production.

Recently RSFSR Gosagroprom issued the order entitled "Ways to Eliminate the Shortcomings in Supporting the Protection of the Environment and the Public's Health When Using Means of Chemicalization in Agriculture." That order states, in particular, that serious shortcomings have been noted in the republic in the use of mineral fertilizers and chemical means for protecting plants. There has been an increase in the rate to which pesticides and nitrates have been polluting the soil, open bodies of

water, and subterranean water, and products of vegetable and animal husbandry in a concentration that frequently is dangerous for the health of human beings and animals.

The chief reasons for pollution of the environment and agricultural output are the irresponsible attitude taken by the administrators and specialists at the farms and agroindustrial formations to this important job; and the crude violations of the technology for the use, transportation, and storage of plant-protection chemicals, mineral fertilizers, and other means of chemicalization.

The order stipulated a number of steps aimed at preventing the pollution of the environment and the agricultural output by residual quantities of pesticides, nitrates, and other toxic substances. The State Plant-Protection Service has been isolated from the makeup of the republic-level (ASSR), kray, oblast, and rayon associations of Agropromkhimiya. It has been established that the protective measures are to be carried out only under the guidance of specialists having certificates that grant them the right to work with pesticides. Kolkhozes, sovkhozes, and other consumers that do not have storage facilities that have been inspected and certified by the sanitation service for their storage, or responsible individuals who have undergone special training, are banned from purchasing chemicals to protect the plants.

The same order stipulates the development of a program for building and activating biolaboratories of republic-level (ASSR), kray, and oblast plant-protection stations and rayon reporting and forecasting points; the submission for approval of a Statute Governing the Plant-Protection Station; and the making of recommendations concerning the payment of the labor performed by the specialists in the state's plant-protection service.

A good initiative has been demonstrated by RSFSR Gosagroprom. But how will the other union and autonomous republics, krays, and oblasts respond to it? It is important for those comrades upon whom the decision-making will depend to take a completely responsible attitude toward this question. There is only one alternative to the chemical method—the integrated protection of plants. Pesticides must be used only when other methods and means have failed to produce the desired results and then only on the basis of the careful study of each field with a consideration of the size of the harmful and useful species, and on the basis of the economic thresholds for the presence of pests, with the strictest observance of the standard procedures and technological schemes. Then we shall not have any repetition of those undesirable negative situations that arise when chemicals are used as a panacea to cure all misfortunes.

And there is one more important question. The only person who can use the integrated plant protection is a specialist with the appropriate area of specialization. That is why it is important for every intensive-type farm to have this kind of person. His labor will repay itself a

hundred-fold: both by the harvest that has been protected against losses, a harvest of ecologically pure produce, and by the health of human beings and the environment.

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Inland Waterways Said To Be in State of Toxicological Crisis

90WN0174C Moscow RYBNOYE KHOZYAYSTVO
in Russian No 6, Jun 90 pp 45-49

[Article by Doctor of Biology V.I. Lukyanenko, Institute of Biology of Inland Waters of the USSR Academy of Sciences: "A Toxicological Crisis in the Bodies of Water"]

[Text] The purity of our natural bodies of water has become a particularly acute problem. Water quality and other water conditions in the commercial fishing waters are the most important factor affecting the numbers and commercial supplies of fish. The amount of waste water dumped into bodies of water of the USSR has increased from 35 km³ to 150³ in the past 20 years alone, which is almost a 5-fold increase, and it is planned to further increase the amount 2.5-fold in the future. A total of 40 km³ of this is discharged without any purification at all. Obsolete and wasteful water use technologies, the inadequate provision of cities and enterprises with purification facilities and the low technological level of the purification are resulting in a situation in which millions of tons of various organic and inorganic substances containing thousands of compounds harmful to marine life are entering the bodies of water along with the waste water.

Toxic chemicals from agriculture pose a particular danger to marine ecosystems and fish stocks. The use of pesticides is growing rapidly in the USSR. It will amount to 440,000-480,000 tons this year. The large-scale, uncontrolled use of pesticides, mineral fertilizers and growth regulators, many of which are carcinogenic or mutagenic and have an enormously harmful effect on commercial fish populations and their food. As much as 60% of mineral fertilizers is lost just in transport and storage. An average of 30-70% of the pesticides used in agriculture end up in bodies of water. The result of such a wasteful and negligent, even criminal, attitude toward the use of chemicals in agriculture and the purification of industrial, municipal and household waste has been a universal rise in the pollution levels of practically all of the nation's most important fishing waters and a drastic deterioration of water quality and the environment for fish. I shall discuss only a few examples describing the extend of pollution of the Baltic, Azov and Caspian Seas.

There are seven highly developed states in which more than 70 million people live in the Baltic Sea basin. It accounts for around 15% of the world's industrial output. The intensive development of industry, agriculture and maritime transport in the Baltic nations are

producing ever-increasing man-made pressure on the environment and the biota of the Baltic Sea. Pollutants enter the water in industrial and agricultural waste and river drainage and are carried there through the air and in the water exchange with the North Sea. The amount of waste water entering just the eastern part of the Baltic Sea's coastal zone has now reached 14 km³ per year, most of which undergoes only mechanical purification. If we subtract from the total the so-called "regulation-pure without purification" waste water (a term not used in GOST 17.1.01-77 but frequently used to describe the composition of drainage water), up to 45% of the remaining discharge of polluted drainage goes into the gulfs of Finland and Riga and the open sea, and 85-90% goes into Kursh and Vislinskiy bays. We should bear in mind the rapid growth of thermal pollution of the water, which originates at nuclear power plants. The volumes of drainage water and other industrial waste entering rivers of the Baltic Sea basin and its coastal zone today equal its potential dilution capacity, and there is no justification for counting on the sea to purify itself or on being able further to increase the load on its ecosystems. According to far from complete data around 600,000 tons of nitrogen, 60,000 tons of phosphorus, around 70,000 tons of oil and petroleum products and 50,000 tons of ligno-sulfonic acids, as well as heavy metals, pesticides, organosilicon and many other compounds enter the sea's coastal zone each year. The highly productive coastal area of the sea, those places where valuable species of fish of various ages feed, suffer the most.

The ecological situation in the Baltic Sea's Kursh Bay, a large freshwater lagoon, is causing particular concern. Around 50 species of fish, including 34 commercial species lived there. Each year more than 500 million m³ of waste water enters the Kursh Bay basin, 335 million m³ of it without any kind of purification. Discharged into the body of water along with the waste water are 55,000 tons of suspended substances, 100,000 tons of organic substances, tens of thousands of tons of sulfates and chlorides, up to 70,000 tons of nitrogen compounds (total nitrogen), around 3,000 tons of active phosphorus-containing substances and considerable quantities of petroleum products, heavy metals and other toxicants. The average annual concentration of ammonium nitrates exceeds the PDK 23 times over; petroleum products, 7 times, with an absolute maximum of 66 PDK in the upper layer of water and 48 PDK in the bottom layer. Concentrations of nitrates and nitrites exceed the PDK, which is a clear indication of eutrophication of the bay water. A concentration of pesticides has been found in bottom sediment in the southern part. Their concentrations in the water do not exceed the PDK but are 2-5 times the PDK in the livers of commercial fish.

There is an even more dramatic toxicological situation in the basins of the USSR's southern seas, including the Azov and Caspian. According to AzNIIRKh [Azerbaijani Scientific Research Institute of the Fish Industry], the average annual concentration of pesticides in the Sea of Azov has increased 5-fold over the past several years.

According to the data for 1988 the total averaged concentration of stable organochloride pesticides alone has increased 17-fold in the sea; 27-fold in the Gulf of Taganrog. A disastrous toxicological situation has developed in the coastal areas of Krasnodar Kray. Amounts of toxic chemicals in the Kuban's estuaries has reached hundreds of times the PDK, several thousands of times the PDK during certain periods. This is the second most important region for the reproduction of commercial fish for the Azov. Concentrations of pesticides in the runoff canals of the region's rice paddies sometimes exceed the PDK tens of thousands of times over. A total of 1.5 billion m³ of contaminated drainage went directly into bodies of water in Krasnodar Kray from farmlands in 1986. Around 17,000 tons of 128 different toxic chemicals have been used in Rostov Oblast alone in recent years, 60% of which have no PDK at all.

An acute toxicological situation is also developing in the Volga-Caspian basin, the nation's main commercial fishing area. Each year 23 km³ of waste water is discharged into the Volga basin alone, 13 km³ of which is what is called "regulation-pure," and 10 km³ is contaminated. In all, more than 40 km³ of waste water enters the Caspian Sea basin each year, which is slightly more than 25% of all the nation's waste water. Hundreds of thousands of tons of suspended and organic substances, tens of thousands of tons of nitrates, petroleum products and phosphorus, hundreds of tons of zinc, copper and other heavy metals and thousands of tons of pesticides enter the Volga and Caspian basin along with it. The contamination of the Volga-Caspian basin with pesticides has become a real disaster. More than 85,000 tons of 108 different pesticides were used in the immediate basin of the Caspian Sea (in Azerbaijan, Dagestan, Kazakhstan, Turkmenia and Astrakhan Oblast of the RSFSR) from 1983 to 1987 (17,000 tons a year).

The "traditional" contamination of the Caspian basin with oil and petroleum products is doing enormous damage to its fish industry. The oil content of the water frequently exceeds the PDK 10- to 100-fold in the South Caspian, 3- to 4-fold in the Middle and North Caspian. The rapid development of oil extraction in coastal regions of the North Caspian, a unique body of water on the planet, is causing particular alarm.

The many years of overall contamination of the Volga-Caspian region by man had to have disastrous consequences for the fish industry. The first signs of the sickness in Volga-Caspian sturgeon appeared as early as 1984 in the form of muscle breakdown and weak sacs. This became a large-scale phenomenon in 1987 and 1988. It drew the attention of the press and the general public. A hasty diagnosis of myopathy was made. This would have been terrible and irreversible, because myopathy is a "progressive *hereditary* (italics ours—V.L.) disease of the muscles involving a breakdown of metabolism in the muscle tissue." Not until the spring of 1988, at the initiative of the USSR Ministry of the Fish Industry, was an interdepartmental scientific team set up at the initiative of the USSR Ministry of the Fish

Industry, whose members included associates of a number of institutes of the USSR Academy of Sciences and the USSR Ministry of the Fish Industry. The "Sturgeon" program was developed, the financing of which was assumed by the USSR Ministry of the Fish Industry (and not the polluting departments). The all-around, comprehensive study of sturgeon, mainly Russian, conducted during the following 2 years under the unified program showed that the "new" disease was not limited to a breakdown of the muscles and deterioration of the roe quality. Many other serious changes were detected in the diseased fish, primarily a breakdown of ionic homeostasis and the metabolism of proteins and carbohydrates, erythropenia and leukopenia, liver dystrophy and necrosis, changes in the kidneys and sex glands, and a breakdown of gametogenesis and gonadogenesis. In addition, studies conducted by fish management institutes detected chloroorganic substances in the organs and tissue of the sturgeon, including such highly toxic substances as DDT and its derivatives, hexachloran, lead, (keltan), (dual) and others. The pesticide content in the liver and fatty tissue sometimes exceeds the permissible levels 2- to 5-fold. Concentrations of cadmium, nickel, mercury, lead, copper and other heavy metals were also found in the sturgeon livers far exceeding the PDK for food products. A critical analysis of the complete data obtained on the biochemistry, physiology, histology and toxicology of the sturgeon, as well as the scope of the multicomponent contamination of the water, the soil and food organisms, enabled us to diagnose the disease of the Volga-Caspian sturgeon as cumulative toxicosis with multisystem infection.

With respect to the toxicological situation in other commercially fished bodies of water in the nation, it should be classified as extremely serious; as disastrous or near-disastrous in some of them (the Aral and Balkhash). Many large and medium-size rivers (the Volga, Dnep, Oka, Kama, Kuban, Ob, Irtysh, Northern Donets and Northern Dvina) and practically all of the small rivers in the nation's settled regions are in disastrous condition. An ecological crisis has developed or is developing in the Azov, Black, Caspian and Baltic seas and in lakes Baykal, Issyk-Kul and Ladoga. It is planned to extract oil in the Sea of Okhotsk, which provides 20% of the All-Union catch of sea fish today.

After assessing the severity of the problems of protecting natural bodies of water and fisheries, we would have to acknowledge that, overall, man's pressure on the marine ecosystems as a result of the so-called "comprehensive use of water resources" has reached the critical level universally. We are at the final line, and if we overstep it a national ecological disaster is inevitable. It is self-evident today that the route which we have taken over the past 30 years in our quest for a "cheap" solution to the problem of protecting our bodies of water from pollution is a blind alley, and the starting concept for resolving this problem with the self-purification (assimilation) capacities of the bodies of water themselves is

fundamentally flawed and has no scientific basis whatsoever. A new strategy is needed—that is, a scientifically based, general plan for protecting the bodies of water of the USSR from pollution, one based on the enormous body of experimental data and field observations.

The enormous amount of experience acquired by the specialists in the field of sanitary hydrobiology and fish management toxicology shows unequivocally that the new general plan for protecting bodies of water of the USSR from pollution must be based on the biological or ecosystem approach, instead of the pseudoeconomic or departmental approach of “minimizing outlays for purifying waste water” which has dominated for the past several decades. With this approach the discharge of waste water into bodies of water or streams was regarded as “one kind of special water use.” It was based on the principle of making maximum use of the capacity of a water facility for self-purification under multipurpose use. The fallaciousness of this concept is becoming self-evident today, when a crisis or a disastrous toxicological situation has developed in most of the bodies of water with commercial fishing. A momentary savings on the purification of waste water is resulting in losses of millions to the national economy, reducing the nation's food resources and threatening human life.

The basic unacceptability of using natural bodies of water as receptacles for waste water, as a sort of “biological purification facilities,” has led Soviet researchers to the fundamentally important conclusion that the only constructive way to protect our bodies of water from pollution is to prevent pollutants from entering the bodies of water and streams. This is clearly born out by almost a century of studying problems of pollution of bodies of water from the standpoint and using the methods of fish management toxicology and sanitary hydrobiology.

Regulation of the discharge of contaminated water into bodies of water by means of the PDK has been and continues to be an important tool for accomplishing this task, although certainly not the main one and all the more, not the only one. Purifying the waste water to a specific level is not a means of fundamentally resolving the problem of preventing pollution, of course, but only a forced and temporary measure, since the imperfect and incomplete purification of waste water is still better than discharging it into bodies of water without any purification. Two PDKs, sanitary-hygienic and fish management, are presently used for protecting surface water from pollution. More than 1,200 sanitary-hygienic PDKs and around 800 fish management PDKs have now been worked out in 4 decades of hard work in this area. At the same time more than 4 million chemical substances are presently known, and approximately 25,000 new compounds are developed each year. Around 150,000 have been classified as pollutants, and from 10,000 to 40,000 end up in our bodies of water. Since, however, dozens or even hundreds of polluting substances whose toxic properties can be combined or

intensified when jointly affecting fish and aquatic creatures, are entering a specific body of water simultaneously, it is perfectly clear that the problem of protecting bodies of water from pollution cannot be resolved with PDKs alone either in the near or the distant future. We should be particularly cautioned, however, against prematurely abandoning the system of PDKs as an important temporary measure for restraining a further increase in pollution of bodies of water with commercial fishing.

In order to adopt the preventive method of protecting bodies of water from pollution we must have new ecological thinking on the part of each and every person and the society as a whole. The logic of the new thinking demands the rejection of the very idea of permitting the discharge of waste water into bodies of water and the concept that self-purification and dilution will do their work in these bodies of water. For several decades many people in our nation and abroad have felt that “self-purification” is a Nature-given mechanism to be used to its full capacity and beyond. The so-called ecological-toxicological studies which regard pollution as a sort of ecological factor are based on precisely these views. Precisely these views are the basis for the so-called normative ecology and the idea, popular among nonbiologists, of “norms” for the discharge of toxic waste into bodies of water. These, they say, should not lead to the destruction of the ecosystems, which provide for the “self-purification” of streams and bodies of water. We need resolutely to reject the stereotypes of the old pseudoeological thinking. We understand that it is not easy to do this, just as it was not easy to change the political thinking in the nuclear age. It was done, however. Life forced us to do it. In politics we now give priority to common human goals over class goals, and in ecology we must proclaim and implement priority for common national interests over departmental interests.

It is especially important for those whose lot it is to deal with ecological problems, and especially hydrobiologists in the field of ecotoxicology, to use as their tools the basic principles of the new ecological thinking (interlinkage and interdependence between nature and the society, the life-support functions of bodies of water and the inadmissibility of discharging waste water into bodies of water). The personal sense of responsibility of the scientists, their ethics and competence and, finally, their human conscience must counter those who, in the race for transient, momentary benefits are prepared, contrary to the truth of science and the truth of life, to sacrifice public interests and defend departmental interests, to justify both the reversal of northern rivers and the construction of ecologically devastating canals for the interbasin transfer of water (“river diversions”) and to “norm” man's impact upon water ecosystems for purposes of “minimizing” departmental outlays for the purification of waste water, to substantiate maximum permissible discharges (PDS) into bodies of water already overloaded with toxic substances, and to insist

on lowering the PDKs for unique bodies of water such as that national treasure, Baykal.

We presented the main components and ways to implement the new general concept for protecting bodies of water from pollution to the All-Union Conference on Fish Management Toxicology (Riga, 1988) and submitted them to the press (Lukyanenko, 1989 and 1990). I therefore consider it essential to stress only its essence here: an organic combining of strategic (little-waste and water-conservation technologies) and tactical (regulation of pollution of bodies of water by means of fish management, ecological and regional PDKs, the filtration of pesticides, water protection sanitary zones, increasing the capacities of purification facilities, improving water purification technologies, and so forth) tasks in the staged resolution of the problem of protecting the USSR's bodies of water from pollution. This approach deserves the closest of attention, because one of the main shortcomings of our ecological policy all these years (if one existed) has been the primacy of tactics over strategy and brief, routine measures for individual basins over long-range plans. A fundamental solution of the problem will depend upon achieving new frontiers in the technology and the equipment for purifying waste water. We must have more than just new technology and equipment, however; we also need cadres, a better caliber of work and new ecological thinking at all levels and in all areas. Resolution of the problem can only be assured with the comprehensive and consistent implementation of the entire package of measures, through their parallel implementation without excesses or distortions.

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Study Reveals Need for Greater Ecological Awareness in Fishing Sector

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[Article by Candidate of Philosophy Ye.V. Nikonorova, Komsomol CC's Higher Komsomol School, and Doctor of Philosophy Yu.P. Ozhegov, Scientific Research Center of Komsomol CC's Higher Komsomol School: "Ecological Awareness and the Fishing Sector"]

[Text] One of the trends in the development of the fishing industry is a growing dependence upon the ecological condition of the fisheries. This trend is clearly manifested in the unique Volga-Caspian basin, where 90% of the world's sturgeon supply is concentrated. Hydraulic engineering works on the Volga, the removal of large quantities of irreplaceable water from it and pollution of the river and sea with industrial and agricultural waste have brought the Volga delta and the North Caspian to the brink of an ecological crisis.

The development of ecological awareness in workers in the fishing industry and other sectors and among the

general population of the Volga and Caspian areas is one of the important requirements for restoring the basin to ecological health.

In view of Astrakhan Oblast's special importance in the fishing industry, the authors of this article chose it as one area for an All-Union study of problems of developing ecological awareness in the youth. A total of 454 residents of Astrakhan Oblast, the Volga and Caspian regions were surveyed as part of the study. They included students at the Astrakhan Technical Institute of the Fishing Industry and Management, members of the Gidroribproyekt institute, blue-collar and kolkhoz workers, and students at secondary schools and SPTUs [special vocational and technical schools].

An understanding of the essence and the role of ecology in the contemporary situation is a prerequisite for acquiring ecological awareness. The term "ecological awareness" is encountered more and more frequently of late in newspapers and magazines, on radio and television. The term is ordinarily used not as a scientific concept, however, but in the figurative, journalistic sense, outside the sociological context: with extremely vague meaning, without "linkage" to regional or sector specifics, outside the sociological context.

Nonetheless, more than 55% of those shared a definition of ecological awareness which includes ecological literacy, an aware and responsible attitude toward nature and actual participation in nature protection and resource conservation. Another 35.2% of the respondents limited ecological awareness to ecological literacy and an aware, responsible attitude toward nature, and 5.3% reduced it to ecological literacy alone.

Negative changes in the environment are evoking growing concern in students, future specialists and workers in various sectors of the economy. When asked whether they were concerned about problems of nature protection and the use of natural resources in Astrakhan Oblast, 77% answered "Yes."; 9%, "No."; 14%, "I haven't thought about it." Around 58% of the respondents expressed great concern about the state of the environment in their city (village, settlement) and its environs, while 38% were somewhat alarmed. Only 3% of those surveyed are not concerned at all, and several people had difficulty answering the question.

Ecological literacy as an integral part of ecological awareness entails an aware interest in environmental problems. In their own estimation, 64% of Astrakhan's young people have developed an increased interest in these problems in recent years (interest did not increase in 14%, and 22% had difficulty answering the question). In the course of the study we were also able to establish the distribution of the youth's cognitive ecological interest in the subject. Of 15 urgent topics listed on the questionnaire, the following drew the greatest attention: 1. Nature, rest and relaxation, and health (66.5% voted for this topic); 2. The specific ecological situation in Astrakhan Oblast (50%); 3. Scientific and technological

progress and the environment (49%); 4. Nature as a factor in the development of the individual (around 46%); 5. The individual's ecological awareness and how to development it (44%).

A growing interest in matters of protecting nature and making efficient use of its resources has helped to orient the young people toward increasing their ecological knowledge. A total of 63% of those surveyed had this orientation; 20% did not presently feel it necessary to increase their knowledge of ecology; 17% had difficulty in answering the question. The predominant motives for increasing their knowledge were the following: for overall development (32%); to be able independently to understand the ecological situation (21.6%); to satisfy an interest in nature and environmental problems (20.3%). A fairly small group needed the knowledge to participate in ecological activities (slightly more than 17% of those surveyed).

Three interrelated sets of knowledge need to be identified in the structure of ecological literacy.

The first set consists of an ecological view of the world which reveals the nature of relations between man and nature. The concept of the new ecological thinking occupies a special place in this vast set. It has replaced the stereotypes of the old ecological thinking.

These stereotypes appeared both at the global level, including ideas about the World Ocean (its inexhaustible biological resources, its infinite capacity for absorbing pollution, and so forth), and at the level of the nation and its individual regions.

It was determined that a part of the youth, albeit a small one, is still influenced by the old ecological approaches to environmental problems and the use of natural resources. In the opinion of 10% of those questioned, for example, our nation covers such a vast territory that the bad ecological state of individual regions is not a basis for serious concern about the environment as a whole. Around 6% of the respondents felt that our nation's natural resources are practically inexhaustible, which means that we do not need to concern ourselves with their efficient utilization.

A considerable part of the residents of Astrakhan and the oblast have already accepted the principles underlying the new ecological thinking.

More than 43% of those who participated in the survey, for example, were convinced that the global nature of ecological problems demands closer interaction between the USSR, foreign nations and international organizations to expand the effort to solve them.

Around 39% of the respondents understood that the extensive application of scientific and technological achievements, particularly low-waste and waste-free technologies, is the main means of improving the use of natural resources and the ecological situation.

More than 34% of those surveyed classified strict coordination of economic activities and ecological requirements in the situation of growing interdependence between economic development and the state of the environment as one of the principles underlying the new ecological thinking.

The figures cited have show two things. Along with reflecting positive changes in the ecological education of the youth, they indicate that many of the youth have still not grasped the fundamental distinctions between the new ecological thinking and the old.

The second, central component of ecological literacy includes a knowledge of the scientific principles for the use of nature and environmental protection, information on the ecological situation and trends in the way it is changing, an understanding of the sources of environmental pollution, ways to prevent it, and so forth.

It was particularly important in the sociological study to determine the degree to which the young people are aware of the factors which have the greatest effect upon the environment in Astrakhan Oblast, including fish productivity in the Volga-Caspian basin. This knowledge is essential both for an overall understanding of the ecological situation and for application in the actual work of eliminating or limiting the effects of specific factors harmful to nature and human health.

Of 13 sources of environmental pollution and disturbances of ecological balance listed on the questionnaire, 40% of the respondents listed machine building, light industry and other enterprises among the main polluters of the air, soil and water; 31%, the extractive industry; 26%, the chemical industry.

On many of the questionnaires the respondents voluntarily indicated specific sources of pollution, most frequently the Astrakhan Gas Condensate Complex, following the start-up of which the ecological situation deteriorated drastically.

More than 24% of those surveyed named the use of toxic chemicals in agriculture among the main sources of environmental pollution. And this is in fact so. Approximately 600 tons of pesticides are washed into bodies of water each year from the rice paddies alone.

The effect of a number of man-made factors on the natural environment was clearly underestimated, however, because many of Astrakhan's residents are not aware of the extent of the damage these factors cause to nature and to their lives.

Fewer than 15% of those surveyed indicated land reclamation as a source of ecological stress, for example. Apparently, few of them are aware that two thirds of the oblast's irrigated land is now saline or boggy because of reclamation work performed in Astrakhan Oblast.

It is difficult to believe, but only 9.5% of the respondents included hydraulic power-engineering among the main sources of damage to nature, particularly to the natural

reproduction of sturgeon. Apparently far from all young people imagine the effects of this construction such as the drastic reduction in the extent of spawning-grounds in the Volga, the blockage of passage to them by dams, the intensive pollution of stagnant pools, and so forth.

The limited knowledge of most of the respondents about the main sources of pollution of the environment and the death of plants, birds, fish, and so forth, is due to the many years when there was no ecological glasnost and to real problems in ecological education.

The third set of knowledge making up ecological literacy involves the interconnection between ecological relations and scientific and technological progress, the economy, the law, morality, and so forth.

We shall restrict ourselves to "measuring" the knowledge of young people in the area of ecology and technology. This is the distribution of answers to the question: "Two methods are used for protecting the environment from industrial waste. Which of them seems the most promising to you?"

A total of 54% of those surveyed chose as their answer: "The development of comprehensive industrial and agricultural units using little-waste and waste-free technologies." The other answer was chosen by 31.5%: "The construction of nature-protection (gas purification and other) installations and plants and the achievement of their efficient and trouble-free operation." The other survey participants had difficulty answering.

The structure of knowledge making up ecological literacy "programs" the main trends in ecological education, which are common for all social groups, and predetermines its comprehensive nature. At the same time a comprehensive approach to its formulation is a prerequisite for effective ecological education.

This approach involves taking into account the specifics of each category of workers (type of occupation, educational level, and so forth) and the ecological features of the region resulting from its natural and climatic, geographic, economic and other conditions. The features of the work performed by fishing industry workers in the Volga-Caspian region must be taken fully into account.

Along with ecological literacy, ecological awareness must include also a high level of ecological consciousness, i.e., an aware and responsible attitude toward nature. This kind of awareness is developed through the logical processing of knowledge, but it constitutes a qualitatively new level above the knowledge itself, because the ecological knowledge is transformed into strong convictions in the people.

It is precisely convictions, the synthesis of which forms a certainty of the extreme necessity of protecting and improving the environment, making efficient use of natural resources, including fish stocks, observing nature

protection laws, and so forth, which determine the value orientation and aims of people and make them aware and responsible to nature.

An attempt was made in the sociological study to ascertain the factors shaping the ecological consciousness of Astrakhan Oblast residents.

This attempt used the assessments of the respondents as to how they were personally influenced by the factors listed after the following question: "Please indicate what has most influenced your awareness of ecological problems." The various factors were arranged in the following order of importance by the group of respondents as a whole.

The largest number of those surveyed (43.4%) acknowledged as the main factors determining their ecological consciousness (concern about the state of the environment, a sense of responsibility for protecting nature, and so forth), the actual ecological situation in Astrakhan and its environs and in the communities in which they live, work and study.

The mass media—the press, television and radio—were in second place overall with respect to their affect upon the ecological consciousness of Astrakhan residents. More than 28% of those surveyed indicated their influence.

In third place as an influencing factor were the personal impressions of residents of Astrakhan and the oblast in places they had visited (on official trips, on vacations, on holidays, and so forth). This factor was indicated by 27% of those surveyed.

Compared to the three factors mentioned above the other 11 were far less significant with respect to the extent to which they affect the ecological consciousness of the youth. And they include almost all of the main methods of developing this consciousness: the training and indoctrinational process in the public education system (only 7.3% of those surveyed indicated this factor), various kinds of promotional work, and so forth.

Attitudes reflecting opinions and thoughts on the main causes of the deterioration of the ecological situation and a predisposition toward and selective attitude toward specific ideas contained in the "prescriptions" for healing the environment were an important feature of the ecological consciousness of the people.

According to the sociological survey, the reasons for alarm about the state of the environment "ranked" as follows (in percentages of those surveyed):

Violations of nature protection laws by the managers of a number of large associations and enterprises, and by other workers—45.4

Inadequately effective monitoring of nature protection and the efficient use of its resources—42.1

Inadequate application of scientific and technological achievements for improving the use of nature—33.3

Departmentalism and a subjective approach to the use of nature in the work of sector administrative agencies—33.0

Lack of ecological enlightenment in a part of the population (indifference, an irresponsible attitude toward the protection of nature, and so forth)—32.2

Lack of a smoothly functioning economic mechanism for utilizing nature—27.8

Inadequacy of material and financial resources allocated for performing the jobs involved in protecting nature—19.4

Ignorance of ecology on the part of many citizens—19.4

Inadequate involvement by the general public in nature protection and resource conservation—17.4

Difficulties in predicting the adverse ecological effects of industrial development—11.0.

This was accompanied by the following question: "It is important to use all means of preserving and improving the environment, but which of them might you single out? Please indicate those means." These were ranked in the following order (in percentages of those surveyed):

Increasing administrative and material liability for violating laws in the area of nature protection—37.9

Involving the general public in various types of nature protection and conservation of resources—35.5

Improving the ecological education of all segments of the population—34.4

Increasing the effectiveness of state monitoring of the use and protection of the land, plant and animal life, and so forth—33.0

Establishing a unified system of state control for the protection of nature and the use of its resources—31.3

Increasing the material and financial means allocated for protecting nature—26.2

Thoroughly studying the possible ecological effects of industrial development—25.3

Improving the economic mechanism for assuring that efficient use is made of nature—19.8

Establishing a system of continuous ecological education in the nation—19.6

Including ecology in the in scientific and technological development, i.e., making it a means of improving the use of nature—15.4

A comparative analysis of the views of Astrakhan Oblast residents on what they consider to be the main causes of strain on the ecology and the most promising ways to

improve it shows a focus on the legal and state monitoring, administrative and educational aspects in the use and protection of nature.

The core of ecological awareness, its "support structure," is ecological work which meets three requirements.

The first is that the work be directed toward the scientifically based accomplishment of current tasks in relations between the society and nature.

The second requirement is that it increase and stimulate nature protection and resource conservation, and develop initiative and creativity in the participants.

The third involves the caliber of the work, i.e., that it be performed by people who strive to improve their skills and acquire new ecological knowledge, and who skilfully apply that knowledge in their practical work methods, in the means and forms.

Sociological studies have shown that the youth are not doing enough in the area of ecology: 3.3% of those surveyed help to organize this work; 4% regularly engage in it; 52% take part in specific ecological undertakings (planting vegetation, and so forth). More than 40% of the respondents do not participate at all or participate extremely rarely in nature protection and resource conservation activities.

The responses to the following question are of special interest from the standpoint of increasing the ecological activity of Astrakhan's residents: "If you do not take part in ecological work, how do you explain this?"

According to the responses, most of those young people who do not take part in ecological work understand its importance. A total of 30% of those surveyed stated that they are prepared to take part in activities to protect nature and assure that efficient use is made of natural resources, but no one in their labor or training collectives seriously engages in organizing this work, and 16.7% of them feel that their understanding of ecology is deficient.

There are many among the youth, however, who do not see the point of ecological work (around 15% of those surveyed) or feel that it should be performed exclusively by the specialists, public figures and leaders who make the decisions (7%).

It is clear from the study results what large reserves still exist for increasing the ecological work of Astrakhan Oblast citizens and enhancing its effectiveness.

The sociological study should help specifically to define these tasks through the prism of the fishing sector's significance in the Volga-Caspian basin.

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IAEA Director Blix Details Chernobyl Investigation Plan

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Second Edition p 5

[Interview with IAEA Director Hans Blix by V. Gubarev and I. Melnikov under the rubric "Chernobyl and the Planet": "The Truth and Nothing But the Truth"]

[Text] The most prominent scientists on the planet accepted the Soviet Government's proposal for conducting a comprehensive investigation in areas affected by the Chernobyl accident. A total of 100 scientists from Austria, Canada, Finland, France, Japan, England, the USA and the USSR, as well as from international organizations—the UN's CES, FAO, WHO and IAEA—are visiting the Ukraine, Belorussia and the RSFSR. They are beginning an expert assessment of the radiological effects on people's health and the environment and evaluating the effectiveness of protective measures. This is the first such project in world science.

Date of birth: 29 July 1957.

Place of birth: Vienna.

"Mother": the scientific and technological revolution.

"Father": international cooperation.

It is significant that when the International Atomic Energy Agency was established, its main mission was defined as follows: to work toward the rapid, extensive and safe use of atomic energy for maintaining peace and the health and well-being of mankind.

The IAEA has the status of an intergovernmental organization. It is directed by a general conference of all member states, the number of which exceeded 100 long ago. The agency has its own budget financed by contributions by participating nations. Although autonomous, the agency, which a staff of more than 1,000, is a part of the UN system and is accountable to the UN General Assembly.

The high-speed elevator, now filling with passengers speaking diverse languages, now discharging them, took us to the 29th and top floor of the Vienna International Center. IAEA Director Hans Blix met us at the threshold of his spacious office. Enormous windows opened up onto a picturesque panorama of the Danube with its islands and of the Viennese woods, spread out on the edge of which was the Grinzig neighborhood, a cherished place for those who love to sit in the shade of chestnut trees with a small glass of new wine.

It was clear to us without being told, however, that Professor Blix could only dream just then of a carefree rest beneath the crowns of the centuries-old Grinzig chestnuts. The burden of important, usually urgent and difficult problems never leaves this heavyset and slow-moving Scandinavian for a minute. And perhaps the most important of them today is the Chernobyl disaster.

[Gubarev, Melnikov] Every report from the disaster area cannot fail to disturb us Soviet people. How much information is the IAEA receiving?

[Blix] I shall begin with something which might appear to have nothing directly to do with the function of the IAEA. I must mention that large group of journalists, who are not scientific specialists, a fact demonstrated in their articles. We frequently see articles published in the USSR and in other countries discussing events which are not linked to and cannot be linked to radiation. Photographs of some calves with six legs, for example. And it is not known whether or not this actually occurred because of the effects of radiation, for such calves are possible also in Australia and in Argentina.

The mass media in the most diverse nations are capable of publishing information representing the truth, half-truths or untruths. As a rule, scientists and technicians have no special training in expressing their thoughts precisely and with flawless style. The press seizes upon imprecisely formulated statements or information. And since journalists sometimes want the situation to appear more dramatic than it is and want people to snap up the newspapers and listen to the radio constantly, this paves the way for unsubstantiated, to put it mildly, sensational stories or "exposes."

[Gubarev, Melnikov] The purpose of our visit is to tell the PRAVDA readers about the expert assessment which will be made in Belorussia, the Ukraine and the RSFSR. We understand that the IAEA is the main participant in this project. Has there been anything of its kind in the agency's history?

[Blix] The Soviet Union put forth the idea of such an expert assessment. It first came up in May of last year. A request then came from the World Health Organization. Last summer three experts from WHO spend a week at Chernobyl and submitted a report. We asked whether our assistance or our participation were needed. The answer was affirmative. The scenario which we are now to follow gradually took shape during the discussion. While we were prepared to begin the project, we found that some [organizations] such as the IAEA did not want to work on it. This is why WHO and a number of other international organizations became involved. Unfortunately, we are familiar with the conventional thinking that the IAEA is made up of pronuclear people. This gave rise to the suggestion that other international organizations be included in the project.

From the very beginning, when we began planning things for the Ukraine, Belorussia and Russia, we wanted to clarify not what was of interest to your official authorities but what was of concern to the people affected by the accident themselves.

The international preparatory commission was assigned the job of determining the radiological aftermath of the Chernobyl accident, assessing its effects upon the health of people and the environment and evaluating measures to protect against the radiological effects of the accident

upon the life and health of the people and on agriculture. We set up an international committee, which included the best scientific forces on the planet familiar with such problems. The project was headed by Japanese Professor Shigematsu, director of a radiology research institute. There were also other experts in medicine and radiology. We sent a large team of experts to Kiev, Gomel, Minsk and several villages in the region. Our "envoys" went there to talk with local doctors, members of various organizations and ordinary people. All of this taken together will make it possible to obtain a clear concept of what questions are troubling the people and which they want answered. We decided to take radiation measurements and analyze them in our laboratories back in Vienna. We do not intend to duplicate and cannot duplicate the measurements taken back then by Soviet specialists. We do not suspect the Soviet authorities of any kind of falsification, of course. Our measurements are only one component of the work. We would not want people to say in the future that the IAEA fully accepted and did not verify the official information.

Then, last spring and summer, we sent a group of doctors to areas affected by the accident to visit hospitals, agricultural enterprises and so forth. We had to establish contacts with Soviet colleagues at our level in order to draw our own conclusions on the radiation effects upon the health of the people. We had to distinguish between possible effects of radiation and other illnesses not related to Chernobyl.

We cannot and will not draw conclusions until this expert appraisal is completed. We have discovered, however, that some of the data which we already have do not coincide with that for Hiroshima and Nagasaki. We have discovered certain symptoms of psychological stress. It exists, after all. We have also noticed certain changes in the diet, which will be studied by specific groups of experts.

We are sending around 100 experts in all to the areas affected by the accident. In answer to your question, I can say that this is indeed the first such undertaking of its scale. The IAEA has never before undertaken anything like it. It is actually not even included in our budget. Typically, the experts we have gathered from various states are performing their work in the USSR without pay. The Soviet side is paying for the material and technical part of it.

I believe that we will have the first results this fall, in October or November. We hope to conduct an open conference in Kiev and Minsk, at which we will be able to discuss with local authorities and representatives of medical institutions and various organizations all of the issues which are evoking debate even among the scientists.

The radiologists, for example, believe that any increase in the radiation level poses an additional risk for people. This is true when the radiation level is very high. We have learned this from Hiroshima and Nagasaki. We do

not know the effects of low levels of radiation, however. If we in fact adhere to this point of view, we shall discover, let us say, that the radiation level is significantly higher in Minsk than in New York, because it is higher above sea level.

I assume you know about the debate in the world about the figure of 35 bers [biological equivalent of roentgen effect]. Naturally, the scientists themselves can argue about what is a sufficiently low or high radiation level to which human beings may prudently be exposed. Do we need to move to the high mountains of Mexico, where the radiation level is higher? Is it reasonable to talk people into remaining in areas affected by Chernobyl radiation and not to evacuate? No one wants to leave his home parts, of course, but if the risk is great, it is preferable to abandon them. I am convinced that such questions should be discussed very honestly.

[Gubarev, Melnikov] We know that the IAEA has conducted an expert assessment of safety at nuclear power plants in France, the GDR, Sweden and the USSR. How do you assess the reaction to your findings in those nations and in ours?

[Blix] We have to distinguish between two different IAEA functions. We have the authority to inspect in matters of nonproliferation of nuclear weapons. With respect to the safety of nuclear power plants, we do not have such authority. Our experts merely come and render their services by invitation. You are right when you say that we have visited many plants in the world. We have been in France, the USA and Japan several times. Groups of experts well familiar with the management and operation of the plants have been sent there. They ordinarily take 3 weeks and thoroughly check the processes involved in operating plants such as nuclear power plants. This does not involve technological expert appraisal or participation in the construction, however. The experts conclude their work by writing up reports and recommendations for improving the operation of the nuclear power plants and assuring their safety. I know that the experts are universally treated with trust and respect and their opinion is heeded, because their good training level is well known. And there is no shortage of requests for visits by the IAEA experts.

[Gubarev, Melnikov] There are people here who criticize the IAEA in connection with its expert assessment of the Gorkiy AEST [Nuclear Power and Heat Supply Plant]. Do they have the right to complain about the expert assessment of the plan for the Gorkiy Nuclear Power and Heat Supply Plant performed by the agency?

[Blix] There was no expert appraisal of the operational safety of the Gorkiy AEST, since the plant had not yet begun operating. This is a plant at which the experts also worked on questions pertaining to the construction and designing. We also do this when we receive a request. There have not been many such cases in the history of the IAEA, however. As an example, we were requested to make such an expert appraisal of the AES at Termelin in

Czechoslovakia to determine the degree of seismic danger and whether there was a danger in case of an earthquake. In general the agency tries to provide the services requested by various nations. As far as I know, there have been no reproaches or complaints about our experts.

[Gubarev, Melnikov] The IAEA is sometimes accused of "departmentalism," of having people with a vested interest working in it. Can they be objective?

[Blix] With respect to nuclear lobbyism, I am personally "pronuclear." The IAEA members include nations which are clearly antinuclear, however. Ireland and Denmark, for example, and even Austria, the country which hosts us. Our General Conference this year will be unable to adopt a unanimous decision recommending the use of nuclear energy. And if you look through or read my presentations, you will never find in them the statement that nuclear energy involves absolutely no risk. Like any other source, it is not risk-free in the area of energy production.

Why do I personally advocate the development of nuclear energy? Simply because it helps to keep the environment clean! It was not nuclear power engineering which resulted in major harm to the ecology in Europe, but mostly power engineering based on fossil fuels. The greenhouse effect is causing the greatest fear today, of course. We must reduce emissions of carbon dioxide by 60 percent. This could be achieved by reducing the burning of fossil fuels. The Greens maintain that this can be achieved by making more efficient use of solar and wind power and the energy of the biomass. I am totally in favor of using more energy from renewable sources. Economically this will not be enough, however. The only alternative to nuclear fuel are fossil fuels. Renewable sources of energy presently account for only 0.1 percent, and this is mainly not solar and not wind power but geothermal energy. Let us hope that the world is not still at this tenth of a percent by the year 2010.

[Gubarev, Melnikov] You once made a beautiful statement: "I am the 'greenest' of the 'greens.'" In connection with this, we would like to ask you the following: Do you remember our discussion of the Chernobyl accident in May 1986? Did you have an idea of its magnitude at that time? How has your assessment of that disaster changed today?

[Blix] At that time the amount of radiation in the air had been measured. Using those measurements, one could calculate the maximum number of people who would fall ill with cancer. I assume that there have been no changes in those calculations. We knew of the 30-kilometer zone but did not know how much time would be required for radioactive decontamination or for reducing the contamination. Nor did we know the level of radiation in other areas outside the 30-kilometer zone. In the Gornyi area, for example. From information received from Sweden and other countries we learned what kind of rain was falling and where, and where the so-called "hot

spots" were. Neither we nor anyone else, I suggest, could have imagined that there would be such a drastic increase in the psychological effects of Chernobyl. I do not know whether much can be done in this respect. In my opinion, the main job of the independent expert commission is to determine the facts. I repeat: the facts! It is more than just a matter of dispassionate registration of the facts, however. We came up with the idea of distributing dosimeters in the villages, for example, and 4,000 were recently delivered. We try to provide the population with as much knowledge and specific information as possible on the occurrence. One should not forget, however, that this was the first accident of such magnitude, and it is doubtful that anyone could have predicted all of its consequences.

With respect to our missions, we at the IAEA will do our utmost to be honest in our expert assessments. Following the Chernobyl accident not enough was done precisely to give the facts to the people. The main goal which we are presently trying to achieve is therefore that of using the expert assessment to show that our conclusions are the truth and nothing but the truth. The people can believe that the best minds, honorable minds, have been assembled for the expert assessment. They will frankly announce what they have seen and learned.

When the Americans learned of the accident at the Three Mile Island AES, they doubted the objectivity of the published reports. This scepticism is repeated on a far greater scale in the Soviet society. I believe that most of your people can think for themselves, however. It is therefore useful to publish the facts.

[Gubarev, Melnikov] Do you believe that nuclear power engineering has already seen its most difficult times or is the peak of the difficulties in its development still ahead?

[Blix] I believe that the world will see a turnaround by 1995. There will be no new orders for nuclear enterprises in the next few years, of course. They will be built perhaps only in Japan, France and certain other nations. The situation will soon change, though.

I believe that the greenhouse effect and certain other problems will show us that the main choice is between nuclear energy and [fossil] fuels. People do not like either one. However, I suggest that we, as intelligent beings, will prefer the slight risk attendant to nuclear power engineering to the danger inherent in [fossil] fuel power engineering, which threatens the world of our children and the children of their children. I believe that they will turn to us and say: You nuclear power experts must further strengthen the safety of existing plants and close down those in whose safety you do not have complete confidence. Or else add equipment and gear at existing plants to bring them up to the modern level. Design new plants which are safer and more reliable. I also believe that the problem of waste safety will also be resolved by 1995.

From the editors: As in the past PRAVDA intends to conduct an honest and open discussion of all the issues

pertaining to the Chernobyl disaster. We would hope that when the independent commission completes its work, its participants will be able to address the parliaments of the USSR, Belorussia, the Ukraine and the RSFSR and report their findings.

Commentary on Results of First Chernobyl Union Congress

90WN0194B Riga SOVETSKAYA MOLODEZH
in Russian 20 Jun 90 p 1

[Article by N. Sevidova: "Our Aroused Reason Boils...Comments From the First All-Union Congress of Chernobyl Movements"]

[Text] In the unprecedentedly heated atmosphere of the nation's current political life, the First Congress of the Chernobyl Union seemingly got lost. The program *Vremya* devoted just one sentence to this event. At the same time, the Chernobyl movements have the right to count on increased attention to their problems. Certainly, it is not merely a matter of corporative interests of the very large detachment of liquidators [persons involved in clean-up procedures] as over 600,000 of them have passed through the Chernobyl Plant since the accident. Although the questions of medical research, aid and social protection for this contingent as before are not being settled on the proper level or are being settled very slowly.

But in principle they are solvable. Not all at once, but they are solvable. It is possible to expand the network of radiological centers and expert councils throughout the nation and have them handle not the 2,500 patients a year as is the case now, but as many as need this at present and as many as will need this in following years. It is possible to raise the level of medical equipping at these centers, the level of medical services for the liquidators and it would be possible with a certain tenacity and efficiency to find funds in order to pay material compensation for the persons who have lost their health and provide a dignified human level of existence for the disabled. Yes, undoubtedly, this would entail colossal difficulties, but these very goals are concrete and tangible. It would be possible to work out some strategy of actions, pool the funds and efforts of the state and the public, seek aid from foreign organizations, firms and charitable societies. All of this is still being done haphazardly but there is some progress.

But I still have a hard time imagining what strategy can be worked out to eliminate the consequences of the disaster on a territory of 24,727 km² and on which live some 3,800,000 persons. The Polesye is not merely a territory. It means too much for the Slavs, and here began Kievan Rus, the Russian state, here lie the roots of the culture of the three peoples. We should save for the following generations at least the icons, the utensils, articles of applied arts and examples of wooden architecture! The pompous Lenin Museum in Kiev should be turned over for these priceless but now lethal exhibits. These were the proposals made at the congress. The

scientists even thought up how to neutralize the terrible radiation from these exhibits.

It is possible to put a protective cover on grandmother's carved chest or spinning wheel but what are you going to do with grandmother herself, where is she to be hidden? People continue to live in the radiation-contaminated areas and carry out economic activities, they grow agricultural products, consume them and ship them out. It is possible to close off a 30-km zone around the Chernobyl Plant, to barricade all roads, put up barbed wire, evacuate everyone down to the last old woman and set up patrols. But it is impossible to evacuate entire oblasts! And in this same Bryansk area which until recently they did not understand that because of the accident, as was ascertained, on individual and very extensive territories, the level of radioactive contamination is even higher than in the 30-km Chernobyl zone. It is essential to evacuate at least the children. Are they to be separated from the parents? And for how long? It is essential to halt lumbering operations, the planting and bringing in of crops, the keeping of livestock and the growing of vegetables. But how are the stoves to be heated, what is there to eat if the stores are empty and how can people live without their usual job?

For now, no one has answered these questions and life in the contaminated areas continues virtually in the former manner. The result is that the level of contamination by radionuclides of the Belorussian population, as research by scientists has shown, is leveling out. But in no way toward a decline. Whether there are any consequences for the other, even the most remote regions of the nation, we do not know as yet as the products are being dispatched from the contaminated areas there. Only in individual instances have the products been blockaded en route to the shelf. The hope is that the share of dirty products in the total kettle of the nation is slight and will not cause harm. But in all regions of the nation the same exposed clean-up personnel reside and for them even an insignificant additional radiation dose is fraught with the most serious consequences. And even for a completely healthy person this dose may mean something as in our age of total pollution of the environment, the human organism is already under destructive effects from all sides.

Does this mean that we should freeze deliveries from the dirty oblasts? But we can understand those who reason like one of our readers: It is better to have radioactive butter than no butter at all. At every step we are confronted with the choice of not better and good or bad and good, but rather between bad and none at all. It is the plight of the impoverished. For this reason, the state program for eliminating the consequences of the accident at the Chernobyl Plant as adopted by the USSR Supreme Soviet was criticized at the Chernobyl congress. As were the activities of the congress itself. But it has still done certain things.

Generally speaking, there were more than enough inflammatory speeches, hysterical comments, protests

and sharp gestures at the congress. Even the procedure of electing the presidium was very tense. The boiling up of passions in the audience was understandable as this was a natural response of persons who are desperate, irritated, insulted and deceived. Unfortunately, emotions at times prevented the congress from working constructively. Moreover, from the very outset there was a certain opposition of the Moscow and Ukrainian Unions which claimed the role as the center of the Chernobyl movements and the "interregionals" held a special position. Friction also arose over defining the structure of the Union and working out a further strategy for its activities.

Many surprises arose in the course of discussing the financial question. As is known, in May we successfully held a TV marathon devoted to the question of Chernobyl. Some 76 million rubles of contributions were collected. The congress delegates were hoping that the Chernobyl Union would have the right to spend these funds. However, it turned out that the money belonged to the organizer of the TV marathon, Peace Fund, and only it has the right to determine where the money is to be put. The account holder of the TV marathon is not obliged to report on expenses to the Chernobyl members. For now, it is totally unclear for what, for example, the foreign exchange portion of the deposits on this account have been used and there was no intelligible reply where the organizers intend to spend the millions of rubles. In any event, the peoples of the Baltic are not to receive a single kopeck from this amount and that has already been finally determined. At the congress a decision was adopted to put under Union control all measures being carried out in the aim of providing charitable collections under the slogan of aiding the Chernobyl victims as well as the production of articles with the symbol of the Union. The congress also examined other opportunities for obtaining money for the accounts of the Chernobyl movements. This would mean creating their own economic and commercial associations, cooperatives and joint enterprises and the profit from these would go for the needs of the Chernobyl victims. Even now it is clear that the amounts will be so large that it is impossible to rely solely on charity. As for the state, it is simply not in a position to seek out billions upon billions of rubles from its own budget to eliminate the consequences of the Chernobyl disaster. Incidentally, it is no longer a question of elimination and I feel that this term from the optimistic announcements from the Chernobyl Plant in 1986 should be abandoned. At present, we can speak solely about the maximum mitigation of these consequences or easing the plight of the victims or the tactics of survival in the contaminated terrain. The congress unanimously viewed the emergency at the Chernobyl Nuclear Plant as a national disaster and turned to the world community with an appeal to provide immediate aid to our nation for this reason. It can only be regretted that the government itself did not do this 4 years ago.

Ukrainian Communist Party Congress Appeal on Ecology

90UN2478A Kiev PRAVDA UKRAINY in Russian
29 Jun 90 p 2

[Ukrainian CP Congress Appeal: "On the Path Toward Harmonizing the Interaction of Society and Nature: 28th Ukrainian Communist Party Congress Appeal"]

[Text] Dear citizens of the Ukraine!

The 28th Ukrainian Communist Party Congress notes with great alarm the ever accelerating degradation of the ecology of the Ukraine. The agricultural industry's intensive pollution of the air and water resources, progressive reduction of the soil's biological productivity, and ill-considered chemization and water management have caused farming activity to attain a critical impact level on all components of the biosphere.

The majority of technological systems used in public production today have practically exhausted their ecological-economic and social capabilities. They promote the rise of those processes in the biosphere whose consequences we are not capable of predicting.

The departmental consumer attitude toward nature and its resources that today's interests predominate over the interests of the republic's future ecologically-balanced socio-economic development is increasingly destroying the ecological foundations of our common existence and our own future. The critical ecological-economic situation that has developed in the Ukraine requires each person to clearly recognize the need to respect, preserve, and defend the environment from the existing threat, to subordinate our activities not only to the economic and biological, but first of all to the moral-ethical laws of society's interaction with nature.

Ukrainian communists will certainly exert every effort to become the advance guard political force in carrying out the humanitarian mission to provide each of the republic citizen's a living environment that is suitable for a healthy life and active creative activity.

First of all, the congress appeals to scientists and experts to increase their efforts to prepare scientific recommendations that permit us to profoundly comprehend the complex series of questions of reviving the harmony of man and nature and to practically carry out the republic's ecologically-regulated socio-economic development programs on the state level. We expect all citizens of the Soviet Ukraine to manifest the desire and readiness to do everything possible and necessary to insure a combination of the interests of society's activities in the biosphere with the problem of its development and economic use of resources.

Only in this manner can we carry out development of ecologically-based technologies that are capable of insuring our public production's transition to a qualitatively new stage of natural resource utilization and to

link the interests of scientific-technical progress, environmental improvement, and a legal management mechanism. We need to predict and control society's activities in the biosphere based on reason, knowledge, and preliminary calculations. Today society, armed with the modern achievements of science and technology, has become an immeasurably powerful force whose might must be placed under the strict control of man's reason. Therefore, each of us really needs new wisdom, new world view principles, and a new morality to preserve and multiply the great wealth of Ukrainian nature for current and future generations and to direct the achievements of scientific-technical progress for the sake of man and the values of his life.

Nature is the unique and wonderfully capable source of the existence of everything living on Earth. While developing plans for our objectively necessary interference in its environment, we need to constantly think about possible alternatives to preserve its ecological balance. Each resident of the Ukraine must assume moral responsibility for the consequences of economic activity and henceforth be guided only by a high civic feeling to insure proper conditions to harmonize the interactions of man and nature!

Ukrainian Communist Party Statement on Chernobyl

90UN2457A Kiev PRAVDA UKRAINY in Russian
29 Jun 90 p 2

[Statement of the 23d Ukrainian CP Congress: "On Eliminating the Consequences of the Chernobyl Disaster and Protecting the Public Against Their Effect"]

[Text] The 23d Ukrainian CP Congress feels that the disaster at the Chernobyl AES has been a major disaster in our times, a national disaster which has left its imprint on the fate of millions of people and to a significant degree has influenced the entire political, moral-psychological and economic situation in the republic.

It is essential to point out that from the very first hours of the disaster, all possible resources and means, and the scientific-technical and production potential of both the republic as well as the nation as a whole were called upon to eliminate it. Participating in this work were the representatives of all the Union republics, which made it possible to quickly carry out large-scale measures to localize the disaster and stabilize the radiation situation as well as to prevent a more catastrophic development of events.

To be condemned is the fact that the central state and economic bodies, having brought together in the first stage in their hands the control over the elimination of the disaster, for a certain time were silent about its actual dimensions and consequences; they did not promptly inform the public about the radiation situation during the first days of the emergency which did not make it possible to provide prompt and complete iodine prophylaxis.

All of this reflected the inability of the administrative-bureaucratic system to properly protect the people, the irresponsibility of the Union departments on this question, and the absence of proper supervision over their activities on the territory of the Ukraine by the republic state bodies.

The Congress feels that it was a mistake of the Ukrainian CP Central Committee that it, in sharing responsibility for eliminating the consequences of the disaster along with the governmental and economic bodies, did not come out openly, publicly and primarily in defense of the people.

As a result, time was lost, serious failings and errors were committed in creating safe conditions for the public of the victim areas and the persons involved in eliminating the disaster.

According to a proposal of the Ukraine, Belorussia and the RSFSR, a unified state program has been worked out and approved by a session of the USSR Supreme Soviet to carry out immediate measures to eliminate the consequences of the disaster for the years 1990-1992. A long-range comprehensive republic program has been worked out. The Congress considers it the most important duty of the party committees and organizations and all communists in the republic and particularly those who have been elected deputies of the soviets and work in the state bodies, to assist actively in implementing these programs, to do everything to protect the people, and to work for constructive collaboration here with all the sociopolitical organizations. It is essential first of all to provide high-quality and complete medical services for the inhabitants of the disaster areas, particularly for children and also persons who have participated in eliminating the consequences of the disaster, to give priority significance to developing the public health system in the disaster areas, as quickly as possible to compactly move people out of the population points where further habitation by humans is impossible, and to create safe conditions for the habitation of those who have remained in the disaster areas. It is essential to organize balanced summer recreation and health measures for children and actually supply the public with "clean" food products.

The Congress emphasizes the necessity of quickly taking out of operation the Chernobyl AES and settling the fate of its labor collective, introducing a moratorium on the further development of nuclear power in the Ukraine, working out a republic Energy Program considering the ecological and economic setting of capacity of the nuclear power plants in the republic's energy balance.

In considering the implementation of measures to improve the radioecological situation on the republic's territory and the protection of persons who have suffered in the disaster at the Chernobyl AES to be a matter of particular state importance and considering the extreme acuteness and complexity of the problem and the necessity of involving many Union ministries, departments

and organizations in solving it, the Congress appeals to the deputies of the Ukrainian Supreme Soviet with a proposal to revise their decision on the Permanent Commission on the Problems of the Chernobyl Disaster so as to give it the status of an emergency commission. It would also be advisable to introduce a separate position of deputy chairman of the Ukrainian Council of Ministers on the questions of overcoming the consequences of the Chernobyl disaster.

We feel that the Ukrainian Council of Ministers should as quickly as possible resolve the question of recovering and burying the radioactive wastes and used nuclear materials which have built up as a result of the emergency and the shutting down of the Chernobyl AES as well as at the other nuclear power plants operating on republic territory and immediately carry out a competent and public auditing of all the facilities for protracted storage and burying of the radioactive materials.

The Congress favors the accelerated elaboration and adoption of laws of the USSR and the Ukraine on nuclear power as well as state enactments which regulate the status of the disaster victims and the participants in the eliminating of its consequences, a system of state benefits and compensation for damage as well as the establishing of legal conditions for the ecological disaster zone. We support the scientists and specialists who reject the 35-rem concept for the safety of habitation and who firmly defend a position of non-threshold safety conditions. We are in favor of the complete and objective informing of the public concerning the radiation situation in the republic and the state of health of the public, we favor ensuring the rights of citizens to conduct skilled consultation and objective dosimetric studies of the environment as well as satisfying the demand for individual dosimetric equipment.

The Congress urges the leaders of the state and economic bodies, the production associations, enterprises, institutions and public organizations to do everything necessary so that the citizens, leaving the disaster areas, are given the proper attention and human concern at their new place of residence.

Belorussian CP Official on Management of Chernobyl Cleanup

*90UN2285A Minsk SOVETSKAYA BELORUSSIYA
in Russian 19 Jun 90 pp 1, 3*

[Interview with Aleksey Stepanovich Kamay, second secretary of the Belorussian Communist Party [KPB] Central Committee, deputy chairman of the KPB Bureau and Belorussian SSR Council of Ministers Commission to Eliminate the Consequences of the Accident at the Chernobyl AES, by BELTA correspondents Ya. Alekseychik and A. Kryzhanovskiy, under rubric "Special-Attention Zone": "Chernobyl: Tragedy, Pain, Search, Hopes"]

[Text] [Correspondents] Aleksey Stepanovich, at the session of Belorussian SSR Supreme Soviet, you made a

proposal to require USSR Ministry of Atomic Power Engineering and Industry to compensate for the material damages incurred by Belorussia as a result of the accident at the fourth unit of the Chernobyl Nuclear Power Plant [AES], and in the event that that department refused to do so to appeal to the USSR Supreme Court. Judging by the reaction in the auditorium, that opinion was supported by the deputies. It has been met by the approval of public opinion in our republic. But hasn't there been a delay with this posing of the question?

[A. Kamay] Much has been said about the Chernobyl disaster. The echo of that misfortune will also be heard in the third millennium. Incidentally, in evaluations of this kind I cannot compete with the journalists, writers, and scientists, but as a person who possesses a rather large amount of information, I can clarify many things.

The losses of the republic's national wealth are so great that one can scarcely think of compensating for them completely. Because almost one-fifth of the territory of Belorussian SSR, where more than two million people live, was subjected to radioactive contamination.

The worst economic damage as a result of the accident at the Chernobyl AES was incurred by our agriculture. In the Belorussian SSR Gosagroprom system alone, the shortfall of output in 1986-1989 is estimated to be 2.355 billion rubles, and during the current year more than 960 million rubles. Almost 300,000 hectares of agricultural land were put out of circulation. The system of animal and vegetable husbandry that had been formed in the republic was disturbed, and it was necessary to carry out the urgent respecialization of agricultural production. The forced application of deep plowing on the fields led to the disturbing of the fertile stratum of the soil, the restoring of which requires many years. In Braginskiy Rayon, the standard peat bogs, which are the best in Belorussia, were taken out of use. Considerable expenditures were required to carry out a series of decontamination operations to reclaim the agriculture. There arose a need for additional equipment and for its more rapid replacement.

But what about the structures intended for production and social-cultural purposes that remain in the appropriated zone, and the roads that have to be resurfaced? Their cost is tremendous. And how does one pay compensation for the impossibility of using a forest, a meadow, or a river?

I have mentioned only a few of the things that were brought to the Belorussian land by the Chernobyl atom that got out of control. But even this is completely sufficient to raise at the republic's Supreme Soviet the question of having USSR Atomic Power Engineering and Industry compensate the nation of Soviet Belorussia for the damages connected with the accident at the Chernobyl AES. I feel that it is necessary legislatively and at the level of USSR Supreme Soviet to determine precisely the total amount of those damages, so that it will not be necessary every year to prove at union

agencies how much money the republic needs to eliminate the consequences of the disaster. Unfortunately, this has to be done even now, when our program has been approved. Therefore, I emphasize, it is necessary at the parliamentary level to establish the damages and to demand compensation for them. And also, why shouldn't that department—which, incidentally, has a rather large amount of currency—allocate part of it voluntarily to equip medical institutions, to purchase medicines, and to render other assistance to children and all the inhabitants of the rayons that suffered? But it seems that that ministry does not feel any moral responsibility for what happened. As for the deadlines for initiating legal action, I shall answer the question with another question: who in the republic, four or three years ago, knew what amount of money they should ask for in their suit? Because in order to know that it is necessary scientifically to evaluate the entire volume of losses, to have a program for compensating for the damages that were incurred. I think that debating today what the deadline is for raising the question means forgetting the main factor and being diverted to the side.

[Correspondents] Since the first days of the accident, Aleksey Stepanovich, you were where the misfortune had happened, with those who were combatting it. Alongside of the scientists, military, and the ministers, you participated repeatedly in the work of the operational group of the Politburo of CPSU Central Committee. And are we correct in thinking that you are ready to answer why many measures proved to be delayed?

[A. Kamay] First of all, I want to say this: I am convinced that the accident became the consequence of the irresponsibility and criminally negligent attitude taken by the administrators of the station, Minenergo, Minsredmash, and Gosatomenergondzor to questions of nuclear safety; the low demandingness toward the cadres with regard to the observance of technological discipline and the procedure for operating the reactor units; the lagging behind in scientific research in a number of problems; and the unsatisfactory fulfillment of decisions by the party and government concerning the guaranteeing of the high reliability of the operation of the nuclear power plants.

I feel that the assertions made by the administrators of Minsredmash and USSR Academy of Sciences concerning the absolute reliability of the reactors that were operating at the nuclear power plants disoriented the cadres, and to a large extent contributed to the sloppiness and complacency of the ministries and departments and the Soviet agencies, and to the weakness of civil defense and radiation medicine, and led to a lack of measures to respond to emergency situations and a lack of highly effective methods and means of decontamination.

Then, when the misfortune occurred, that also decisively influenced the making of decisions.

Judge for yourself. Six days after the Chernobyl accident, the country's government issued an order concerning the evacuation of people from the 30-kilometer zone. Are we really supposed to believe that at that time USSR Council of Ministers, USSR Academy of Sciences, the Ministry of Defense, and specialists did not know what quantity of radio nuclides had already been spewed into the air, what their percentages and structures were, what the wind pattern was and where it was likely that there would be fallout onto the ground and contamination of the territory, or what the consequences could be? I think that they was no way that they could have failed to know this. And if indeed they did not know it, then this is even worse. I am mentioning this because the area and perimeter of the zone were determined imprecisely. Subsequently, on the territory of Gomel Oblast alone, it was necessary in 1986 to carry out two additional evacuations of people.

[Correspondents] Do you have any serious claims against the scientists?

[A. Kamay] When you think over what you have lived through, what you have experienced, and when you evaluate the situation today, you can say that all of us have traveled the path from the minimal radiation knowledge dealing with civil defense to serious scientific approaches to radiological problems, but, most importantly, we have traveled the path from disorganized, frequently inconsistent governmental decisions and recommendations by scientists and specialists to the republic-level, and then union-level State Program, adopted by USSR Supreme Soviet, for eliminating the consequences of the accident at the Chernobyl AES.

I think that now, four years later, we can objectively and without any prejudice consider how time-responsively and consistently the practical tasks of eliminating the consequences of the accident were carried out during the first days and months after it occurred. This is how it happened.

By 27 April, on the territory of Braginskiy, Narovlyanskiy, and Khoynikskiy rayons, 62 civil-defense radiation and chemical observation stations were set up. By the end of 29 April, 654 of them were already operating on the territory of Gomel Oblast.

On the farms adjacent to the nuclear power station, agricultural field operations were discontinued. By the end of the day on 1 May, we evacuated children and pregnant women from 25 populated places and housed them in sanatoriums and dispensaries in Gomel Oblast.

On the territory of Gomel Oblast, in the three southern rayons, medical treatment was provided to 115,500 persons. But today it is completely obvious that the deadlines for carrying out those measures should have been more rigid, and the scope should have been many times greater. The republic's Minzdrav, although it did undertake energetic measures, proved to be unready for that emergency situation.

In conformity with the government's 2 May 1986 decree, the evacuation of the population began, and by the end of the day on 5 May it was practically completed in Gomel Oblast. The population in 50 populated places was evacuated from the 30-kilometer zone.

On 6-7 May children and pregnant women from all the populated places in Braginskiy, Khoynikskiy, and Narovlyanskiy rayons were evacuated and housed in pioneer camps, dispensaries, and sanatoriums in the oblast. Subsequently they were all sent to sanatoriums and rest homes in Minsk, Grodno, Brest, and Vitebsk oblasts.

The radiation situation was monitored by subdivisions of USSR Gosgidromet, USSR Academy of Sciences and Belorussian SSR Academy of Sciences, Ministry of Defense, Gosagroprom, and other departments. On the basis of their data, a determination was made in the country of the level of the maximum admissible load on people during the first year after the accident of no more than 10 rems. It was established that that indicator during the first year, with the existing nature of the contamination, corresponds to a radiation level of 5 milliroentgens an hour as of 10-11 May 1986. In conformity with this decision of the USSR and Belorussian SSR government, in Gomel Oblast from 3 June through 9 June the population was evacuated from 28 additional populated places in Braginskiy, Khoynikskiy, and Narovlyanskiy rayons.

The scientists continued to refine the radiation situation. First they determined the limits of the rigid monitoring levels, beyond which habitation is impossible. These are, first of all, such criteria as 0.1 curie per square kilometer for plutonium, and 3 curies per square kilometer for strontium. As a result, on the territory of Gomel Oblast, in effect, two appropriated zones were formed. In September, the population was evacuated from 29 additional populated places.

During 1986 as a whole, in Gomel Oblast the inhabitants were evacuated from 107 populated places—a total of 24,700 persons.

In conformity with the dosimetric-monitoring data that was received at that time, by the 11 June 1986 decree of the Belorussian CP Central Committee and Belorussian SSR Council of Ministers dealing with the finding of jobs and providing of housing and social and everyday services for the population of Gomel Oblast that had been evacuated from the zone of the Chernobyl AES, a list of farms and populated places where it was planned to build settlements for the evacuated population was prepared and submitted to Gosstroy. As for Mogilev Oblast, in 1986 the population was not evacuated, since those indicators for the radiation level there were lower. Construction of housing was not carried out in that oblast.

During 1986 and the first half of 1987, on the territory of Gomel Oblast, almost 10,000 apartments were built in 169 populated places; a large number of schools, children's preschool institutions, enterprises for public

nutrition and trade, and institutions serving everyday and cultural needs were erected; and steps were taken to find jobs for the able-bodied population.

The fact that the evacuation zone was initially defined imprecisely is attested to by the following situation. After the refinement of the radiation situation and the carrying out of a large volume of work to decontaminate the area, 1612 inhabitants of 12 populated places in Braginskiy Rayon were re-evacuated to their previous places of residence. The criterion that we were guided by for the contaminated territories for the safe habitation by the public had been approved by the center.

During the years that have elapsed, more than 3.5 billion rubles were expended for the republic as a whole to eliminate the consequences of the accident. More than 12,000 homes and apartments, and hundreds of structures intended for cultural-everyday and municipal needs, were built for the evacuated population and the population being resettled. First-priority operations were carried out to improve the contaminated populated places and to decontaminate their territories, and to improve the medical, trade, everyday, and municipal services provided to the population that had suffered. A series of agrotechnical, agricultural-reclamation, and other measures were carried out.

Apparently, no one will deny that all this made it possible to reduce considerably the possible load upon people's organism. But that conclusion definitely does not give anyone any right to be complacent.

[Correspondents] You have touched upon the question of the operations to decontaminate the area. Different opinions, which are at times mutually exclusive, exist concerning the desirability of carrying them out...

[A. Kamay] Yes, I did encounter different points of view, and harsh criticism of these measures.

In Gomel Oblast, the decontamination operations began on 10 May 1986. They were carried out only in the three southern rayons. For 1986 as a whole, a total of 246 populated places were decontaminated; 31,750 homes, 125 schools, 94 children's preschool institutions, and 24,000 hectares of terrain were processed; and approximately 6 million cubic meters of dirt were removed and buried. Operations were carried out to decontaminate the roads, streets, and equipment.

In Mogilev Oblast in Krasnopol'skiy, Cherikovskiy, and Kostyukovichskiy rayons, in 1986 decontamination operations were carried out in 20 populated places, 1687 homes, 38 schools, and 20 children's preschool institutions, and approximately 300,000 cubic meters of dirt were removed and carried away. In Brest Oblast during the first year after the accident no decontamination operations were carried out.

With all the criticism of the decontamination operations, with all the shortcomings that occurred while they were being carried out (including the lack of a scientific base),

it must nevertheless be admitted that the comprehensive decontamination, with the improvement of the populated places, made it possible to lower the level of contamination in the territory by one-third to one-half.

The decontamination operations are also being carried out at the present time. The operations to provide sanitation processing and amenities for the populated places will have to be carried out on the entire territory with a radioactive-contamination density of one or more curies per square kilometer.

[Correspondents] But let's return to science again. We have heard repeatedly that there were no scientific priorities in the republic. But it was specifically the Belorussian scientists who, earlier than the other ones, came to the conclusion that it was necessary to carry out radical measures. And the scientists themselves assert that practically from the very first days they informed the government about everything and proposed taking more radical steps.

[A. Kamay] Once again I would like to answer with a question: what scientific recommendation did the authorities fail to fulfill, particularly the authorities in Gomel Oblast? I'll give the answer: none.

The Belorussian scientists did have information, but it basically contained data concerning the refinement of the radiation situation in individual territories and populated places. There was no well-formed conception, and it must be noted that there isn't any to this day. Apparently for that reason today the practical workers who engage in eliminating the consequences of the accident are making claims primarily against fundamental science. Because the fact is that during all the four years after Chernobyl USSR Academy of Sciences did not make a statement concerning a single major question on which the branch scientific subdivisions had made their conclusions and recommendations.

At the first stage of the elimination of the consequences of the accident, unfortunately, not even our own republic academy had any clear-cut evaluations of the situation or any recommendations. This, for example, is what was recommended in the 14 May 1986 memorandum of the Belorussian CP Central Committee that was signed by 12 scientists from Belorussian SSR Academy of Sciences: "A first-priority task is the need for the complete medical-radiological study of a limited group of persons who were evacuated from the evacuation zone, by using SICH [human radiation counter] units that are at the disposal of the Institute of Biophysics, USSR Minzdrav and the Institute of Medical Radiology, USSR Minzdrav. It is necessary to establish scientifically substantiated time standards for the content of the basic radioactively dangerous isotopes in the soil, vegetation, water, and food products, and to monitor strictly their observance in places where people reside..." (Who is supposed to establish them? The departments?...) And it was not until 25 April 1989, above the signature of Academician V. P. Platonov, president of Belorussian SSR Academy of

Sciences, that the decision of the Belorussian SSR Academy of Sciences presidium's bureau on questions linked with the scientific research on the problems of eliminating the consequences of the Chernobyl accident on the territory of Belorussian SSR was submitted. It was not until three years later that we received from Belorussian SSR Academy of Sciences any meaningful considerations of the Chernobyl problem. A considerable contribution to this study was made by the Institute of Radiobiology and its director, Ye. F. Konoplya.

All the measures to protect people against radiation, and the evaluation of their effectiveness, are carried out today on the basis of data provided by scientific institutions and the radiation-monitoring system that was created by the republic's ministries and departments. At the present time research on problems of radiation is being carried out at 19 academic institutes of Belorussian SSR Academy of Sciences, 10 institutes of Belorussian SSR Minzdrav, and 9 institutes in the Belorussian SSR Gosagroprom system. Institutes that have been specially created are the Institute of Radiobiology, Belorussian SSR Academy of Sciences; and the Institute of Radiation Medicine, with a clinic and dispensary subdivision, and branches in Gomel and Mogilev. The Belorussian Branch of the All-Union Scientific-Research Institute of Agricultural Radiology has been formed in Gomel.

However, unfortunately, until the present day no one—not USSR Academy of Sciences, or our republic academy, or Minzdrav, or Goskomgidromet, or the other departments—have worked out an integrated conception of the comprehensive medical-biological, social, psychological, and economic rehabilitation of the persons living on the contaminated territories. They have not yet succeeded in merging together the available data concerning the radiological situation, or in coordinating their approaches to evaluating the degree of danger or the possibility of human habitation in each specific populated place. The republic has approximately 2700 such settlements. And our scientists' first-priority task is to prepare, in the shortest periods of time, radioecological data sheets for each populated place, with findings concerning the possibility of safe habitation, and also with a list of the necessary steps the fulfillment of which will assure the creation of such conditions.

[Correspondents] Aleksey Stepanovich, in July 1987 the operational group of the Politburo of CPSU Central Committee defined the status of the evacuation zone. Since that time the bureaus of the party's Gomel and Mogilev obkoms have expressed demands concerning the creation of a special-purpose state program for eliminating the consequences of the accident. But, all things considered, wasn't it possible even then to discern disorganization and contradictions among the many recommendations and problems on this score?

[A. Kamay] In general, yes. After the accident and the making of the decision to evacuate people from the 30-kilometer zone, when it was necessary to act in a

precise and well-coordinated manner, in general everyone did indeed act in that manner, although with certain inevitable mistakes, but in a sufficiently responsible way. Rapidly, albeit with certain rough spots that were subsequently eliminated, settlements were erected for the persons who had been resettled. I am well aware of this. I myself was a direct participant in those many-faceted complicated events. It was not until later on, when the first emergency measures to save people had already been taken jointly by us and the republic agencies, that we saw the appearance of various state commissions, "well-wishers," and advisors from the interested union ministries and departments. There also appeared the theory that in the zone of permanent (rigid) monitoring, with 15-40 or more curies per square kilometer for cesium, resettlement was not desirable, and that it was allegedly possible to get by with the shipping in of pure food products, the decontamination of the populated places, and the organizing of paid vacations and medical treatment for the population, especially the children, outside the confines of the particular zone. I shall state frankly that such recommendations, supported by names and high titles that are well-known in the scientific world, exerted an influence not only upon our decisiveness, but also on all our actions. You might recall that during the first two years after the accident the country's government showed a large amount of concern for the situation that had developed. Gomel Oblast was visited by N. I. Ryzhkov, V. M. Chebrikov, V. P. Nikonov, V. I. Dolgikh, and V. S. Murakhovskiy, and was also visited frequently by deputy chairmen of USSR Council of Ministers. Many questions were resolved in a time-responsive manner, and the population met this understandingly. But later on, when a certain conception triumphed, people began listening less to us, and with less understanding. It became more difficult to knock on many office doors, and the sharp criticism there did not receive the proper reaction. I want to emphasize that the events should be evaluated specifically in the context of the radiological evaluations of that time.

The Belorussian state program to eliminate the consequences of the Chernobyl accident was developed with a consideration of the new criteria for the safe life-support of the population residing on the contaminated territory, that take into consideration both the level of the radiation load on the population throughout their life, and the level of contamination of the territory with radio nuclides (15 or more curies per square kilometer). It is on the basis of these criteria that people are evacuated and a series of other socioeconomic and rehabilitation measures are carried out. Essentially speaking, this is a series of measures that include: raising the level of medical service and the improvement of the life of the population, primarily the children; the re-specialization and the bringing of the technology in the branches of the agroindustrial complex and the processing branches into conformity with the requirements dictated by the conditions for radioactive contamination, with the purpose of producing pure output; the providing of the population with pure food products; the organization at the required

level of the scientific support of the problems that are linked with normal vital activity in the contaminated rayons; and many, many other things.

A large amount of work, a very large number of complicated and unique problems lie ahead of us. They can be divided into two groups. The first group is made up of the problems that should be resolved strictly within the established time limits. I am talking about the evacuation of the population from the zone where the radiation level is more than 40 curies per square kilometer for cesium and where the load on the organism can exceed calculated 35 rems during a 70-year lifetime, and the evacuation from the zone with 15-40 curies per square kilometer of women with small children, pregnant women, and, in general, persons with medical contraindications or those who wish to leave. The second group is made up of everything that has to be done to resolve the problem of the safe habitation by the population on the contaminated territory with one or more curies per square kilometer.

Enough has already been stated about the deadlines for resettlement, and I shall not repeat those statements. I shall note only that, as of today, 2996 families have been required to evacuate the zone. For the most part, they have been set up in the safe rayons of Gomel, Mogilev, and Minsk oblasts. The evacuees in the first stage will receive the remaining housing in clean zones of Gomel, Mogilev, and Brest oblasts, where 45 modern rural settlements are being built. This will make it possible to resolve the problem of evacuating the inhabitants from the zone with 40 or more curies per square kilometer not in 1991, as is stipulated by the program, but during the current year. At the same time, having recently visited Krasnopol'skiy and Kostyukovichskiy rayons, I conclude that the Bureau of the Belorussian CP Central Committee and the republic's government must begin immediately to make a major improvement in all the work of building the housing. The delays and the irresponsibility in this matter are inadmissible.

Additional steps were taken to evacuate ahead of anyone else the families with children aged up to 14 years, pregnant women, and persons with medical contraindications from the populated places in the permanent-monitoring zone (15-40 curies per square kilometer). By a joint decision of the Belorussian CP Central Committee, Belorussian SSR Council of Ministers, and Belsovprof, it is planned to allocate in 1990 and the first quarter of 1991 as much as 20 percent of the housing area being activated in the republic, with the mandatory compensation of the capital investments to the local soviets and organizations in the next year. That will be an additional 7418 apartments and homes.

In order to accelerate the resolution of the problem, there has been a reduction in the volume of construction-and-installation operations at projects intended for production purposes. Assignments have been given to the construction ministries to construct, with the use of the economized funds, 1110 additional apartments for the

families being resettled. It is also planned to erect this year, by using the in-house method, apartment houses with 2000 additional apartments for resettled individuals.

Computations indicate that the republic has the opportunity to fulfill all the assignments of the state program for resettling the former inhabitants of the 15-40 curies per square kilometer zone as early as 1992, that is, three years earlier. The most important thing is that we must work persistently and aggressively in this direction.

In addition to the resettlement problems, the questions of the social protection of people are no less critical. These problems include, first of all, problems of providing medical services to the population in the territories that have been contaminated by radio nuclides. They also include the shortage and the large turnover rate of medical personnel; the lack of the necessary medical equipment and medicines at many medical-prevention and treatment institutions; and the insufficient rate at which the former inhabitants of the rayons that have suffered, and especially children and adolescents, are being provided with trip tickets to sanatoriums and health resorts.

Unfortunately, because of the sluggishness of Belsovprof and the construction organizations, there have been no extended efforts to erect the recuperation base that was stipulated by the state program: sanatoriums with accommodations for 1500 parents and children; children's sanatoriums to accommodate 1000 children; and pioneer camps to accommodate 60,000 children.

When speaking about the fact the people of Chernobyl need the state's social protection, we must be completely aware of two factors. First, this can be provided only by the purposeful, comprehensive policy of the country's government and the AUCCTU in the job of improving the health of the entire population of the rayons that suffered. Secondly, this requires a law governing the social protection of the people who suffered from the Chernobyl disaster.

From whatever direction we approach the problems of Chernobyl, we must have just one goal: to avoid every risk, and to do everything possible and necessary to preserve the health of the present and subsequent generations, to create safe conditions for human habitation.

But I cannot fail to mention also the fact that individual citizens, with the purpose of making their presence known, of somehow coming out into the forefront in the present sociopolitical situation, have begun spreading various kinds of conjectures and rumors. Unfortunately, the topic of Chernobyl is not always reflected effectively, with professional efficiency or consistency, in the mass media. There have been instances when, instead of a businesslike discussion about the real situation in the outlying areas and about the methods and means of resolving the problems, the preference is given to the

emotions and no effort is made to rebuff the demagogues, political instigators, and speculators. It is necessary for all of us to work very aggressively to help every individual, and the entire population in the republic, to have a thorough understanding of the ecological and sociopsychological situation, and to help people to act correctly, guided by the scientific criteria and the specialists' recommendations. We must not allow the population's low level of radiation literacy to be used to incite mental and emotional tension in society.

[Correspondents] Aleksey Stepanovich, dozens of people have been expelled from the party, or have received reprimands with the formulation "as a result of the political immaturity and faint-heartedness demonstrated during the elimination of the consequences of the accident." Isn't it time to return to a review of these personal files?

[A. Kamay] The review of questions concerning expulsion from the party, as well as the questions concerning the restitution of persons to its ranks, must always be carried out in a completely individual manner. This is an immutable norm in party life. But let us deal with the specific instances that you have mentioned. In 1986 (after the accident) and in 1987, 19 persons were expelled from the party in Narovlyanskiy Rayon; 11 in Khoynikskiy Rayon; and one person in Braginskii Rayon. During that time, respectively, 482, 719, and 833 Communists were removed from the rolls and left the confines of those rayons. In Mogilev Oblast during that period, 48 persons were expelled from the CPSU in Krasnopolskiy Rayon; 29 in Kostyukovichskiy Rayon; and 3 in Slavgorodskiy Rayon; and, respectively, 121, 116, and 135 persons left those rayons. As you can see, there was no wholesale approach.

But in this regard I would like to consider the question that has been raised from a different point of view—the moral one. Is it befitting for a Communist, in a situation when others are saving people, to be faint-hearted about what motivations he is being guided by?

Every Communist who feels that the question of his membership in the party was incorrectly resolved has the opportunity to appeal to a party agency or to the 31st Belorussian CP Congress or the 28th CPSU Congress, requesting the re-examination of his personal file.

[Correspondents] Do you feel that a temporary commission to investigate the reasons for maintaining secrecy about the scope of the tragedy that occurred should be created under the Supreme Soviet?

[A. Kamay] I am in favor of giving complete publicity to everything that we knew and the standards and decisions that guided us. I see that a considerable number of cadres, scientists, and specialists who, by touch, began unselfishly to eliminate the consequences of the accident and to save people are today being subjected to the critical fire of persons who sat things out on the sidelines or of political instigators. With hindsight we have all

become more intelligent, more efficient, more sober-minded, and more cautious, but back then life required us to make decisions with the rather meager knowledge that we had at our disposal. Truth must triumph, even tardily. Nor should the country's government remain silent about this question.

If I may speak very frankly, I will say that apparently I have a greater self-interest than others in this kind of commission, because a rather large number of accusations of various kinds have been directed personally to me. But they are accusations that I cannot accept. There were miscalculations and mistakes, but when we were in Gomel Oblast my comrades and I were trying to give our maximum effort, guided by the radiological criteria for the protection of the population.

[Correspondents] Yes, the mail that we receive also includes letters that criticize you...

[A. Kamay] You mean that all these letters are critical?

[Correspondents] No, not all of them. For example, V. A. Fedosov, of Mozyr, wrote us that he rejects the wholesale censuring of all the workers in the party apparatus. He respects many for their honesty and decency, and he mentioned among them Gorbachev, Kamay, and the late Mazurov...

[A. Kamay] Thank you, Comrade Fedosov, for your kind word. But, if I may continue the thought that was begun, I would like to say that I have a self-interest in evaluating all the actions during that complicated period. As a human being, it is also difficult for me to walk around burdened down by undeserved accusations.

[Correspondents] In this instance, please allow us to ask one more question that may be somewhat personal for you. When we were in Gomel Oblast recently, we heard statements made by the current administrators of the oblast to the effect that their conscience, from the point of view of the actions undertaken to eliminate the consequences of the nuclear accident, is as pure as a baby's tears. We also heard those words in your presence. But at that time everyone was working together, and, moreover, under your guidance. How, then, does one differentiate between blame and innocence?

[A. Kamay] I believe in people's common sense. Life will put everything in its proper place.

Mobile Dosimeters at Work in Belorussia

*LD3008140590 Moscow Domestic Service in Russian
1100 GMT 30 Aug 90*

[Text] Mobile dosimetric laboratories of the Belorussian Red Cross Society are on the streets of Minsk. In the presence of visitors, especially trained physicians are analyzing foodstuffs. Such laboratories equipped with instruments purchased with foreign currency and custom-made by the local Lenin Association, quickly determine the total content of radionuclides. The laboratories on wheels make checks at the request of the populace and

enterprises. Under the flag of the Red Cross Society, points of dosimetric control are being set up in other towns and villages of Belorussia.

Militia Affected by Chernobyl Under Observation

*LD3008140190 Minsk Domestic Service in Belorussian
0515 GMT 29 Aug 90*

[Text] At present, there are nearly 17,000 militiamen under medical observation who did stints in the Chernobyl zone, including 1,000 who had to work in the affected area and received a radiation dose of 25 ber or more. Special burdens were placed on the shoulders of the personnel of the Ukraine and Belorussian Internal Affairs Ministries and of bordering oblasts of the Russian Soviet Federated Socialist Republic.

In the polyclinics run by the internal affairs departments of the Gomel and Mogilev Oblast Soviets, teams are being organized for full checking-up of those still living in the irradiated areas. A medical center of the USSR Internal Affairs Ministry is being set up in Kiev. All this is being done thanks to the redistribution of the means available.

Reforms in RSFSR Nuclear Energy Program, Standards Urged

*90WN0190A Moscow LITERATURNAYA ROSSIYA
in Russian No 23, 8 Jun 90 pp 16-17*

[Article by Boris Kurkin: "System of Nuclear Irresponsibility"]

[Text] The development of strict and dangerous technologies, such as nuclear power engineering, requires society to guarantee a number of cultural-psychological, sociopolitical, and economic conditions lacking which society is putting itself on the brink of suicide.

One of these conditions is the existence of a rigid system of sociopolitical and legal responsibility borne by the persons and departments that make the decisions about the planning, development, and implementation of nuclear power programs.

The need to create a system of sociopolitical and legal responsibility borne by the persons and departments implementing these programs is for us even more essential since we have begun to hear on the part of our nuclear ideologues soft voices about "the impossibility of guaranteeing the absolute safety of operating the nuclear power projects." (Who could have thought that!) In a word, the "bright (radioactive) future" has already been guaranteed for us, and consequently we now discuss only how quickly we will find ourselves in it.

We shall now see whether the population that has suffered after the latest nuclear catastrophe will be able to experience psychological satisfaction from the fact that all the guilty individuals (including the still unpunished persons guilty of Chernobyl) will be punished.

We shall see the extent to which the fear of responsibility is for the responsible workers and simply the workers of our "Chernobyl departments" an incentive to the proper execution by them of their direct official duties.

However, for that purpose we need to analyze all the incentives of that type that exist in society's arsenal. Essentially speaking, there are not many of them. The first and chief one is the "fear of God" (in lay understanding, conscience). The second is the fear of possible punishment that is completely "of this world" (for example, criminal punishment). And, finally, the third is self-interestedness in efficient labor.

The sense of the "fear of God" was analyzed at one time in our country. And seriously so. Incidentally, the number of crimes—large and small—did not decrease in the least as a result of that, and we nowadays have to be convinced of them from the bitter experience of our glorious history.

But nevertheless let us speak a bit about the "fear of God" and about conscience.

When, at the 1st USSR Congress of Radiobiologists, which was held in August 1989, the topic of discussion turned to the standards for safe habitation on the land that had been contaminated after the Chernobyl catastrophe, the well-known radiobiologist S. P. Yarmonenko stated that if the congress rejected the concept proposed by the Institute of Biophysics, USSR Minzdrav [Ministry of Health] and personally by Academician L. A. Ilin, we will be required today to resettle the Belorussians (as they are demanding), tomorrow the Russians from Bryansk Oblast, and the day after tomorrow, the Ukrainians. The state will have to spend a minimum of 50 billion rubles for resettlement, "and we don't even have any soap," he said, completing his speech. Hmm... Are people cheaper than soap?

B. S. Prister, I. V. Filyushkin, and a certain A. K. Kartover spoke in the same vein. The last-mentioned said that if the congress rejects L. A. Ilin's position, "that will cause irritation at the administrative levels that will make the decisions about resettling the people, because the state does not have any money." A. K. Kartover emphasized, "We are a scientific forum, not a political one."

According to Kartover it turns out that the scientists do not and must not bear the responsibility for everything occurring in their department throughout the country, although it is precisely from them that the directive agencies are awaiting the recommendations. Might one be permitted to ask what kind of "chimera called conscience" this is, which is oriented not at strict scientific data, not at the responsibility for the life, health, and fates of their fellow countrymen, but only at whether the scientist's position will or will not evoke the leadership's dissatisfaction?

Let us ask ourselves to imagine what would be done if the place of Comrade Yaromenko, Prister, Filyushkin, and

Kartover were occupied, say, by A. M. Butlerov, D. K. Mendeleev, and I. P. Pavlov—people who were believers and who had a conscience.

Incidentally, Comrade Yaromenko for his textbook on radiobiology was awarded a 1989 USSR State Prize, for which we indeed congratulate Samuil Petrovich.

The question is about something else: can we be placid about our children's health if heartless prizewinners are in charge of our medicine?

By the way, even our non-prizewinners say there's nothing to worry about. This is what V. P. Antonov, head of the Laboratory of Antiradiation Protection of the Population, All-Union Scientific Center of Radiation Medicine, USSR AMN [Academy of Medical Sciences], says: "It can be confidently asserted that there will not be a single case of 'Chernobyl' cancer, that is, a case of radiation origin, and there cannot be any either from the theoretical (please forgive me for asking, but why say this, if there has been a fallout of approximately a half-ton of plutonium alone?—B. K.) or from the practical point of view" (V. P. Antonov, "Uroki Chernobyla" [Lessons of Chernobyl], Kiev, 1989, p 90. This pamphlet, I would like to note, was allowed by the GKAE [State Committee [State Committee for Utilization of Atomic Energy] censorship]. Yes. Not even Academician L. A. Ilin or Corresponding Member A. K. Guskova would be so bold as to make that discovery...

So don't worry about Chernobyl. Everything is taken care of. And, essentially speaking, no soap will be required. Because, as becomes obvious from the works of V. P. Antonov, washing without soap reduces the dosage of external radiation by a factor of 10, and with soap by a factor of 50 or more (p 33). So it turns out that if you wash yourself five times without soap, that's the same as washing yourself once with soap. That information, as one can easily be convinced, is strategic.

Now let's talk a bit about the system of social responsibility in our society.

One of the conditions for the criminal nuclear expansion in our country is the lack of any system of sociopolitical or legal responsibility borne by the persons who plan, prepare, and administer the implementation of nuclear power projects in our country. What we do have is an ideally functioning system of collective irresponsibility.

Something that can serve as a rather good illustration of the system of mutual lack of monitoring and the mutual irresponsibility that have developed between the "upper classes" and the "lower classes" in the nuclear pyramid is the situation with the steam generators for the VVER-type power units.

We have already dwelt on this question in a previous article, entitled "Stew Made From Dead Rats" (LITERATURNAYA ROSSIYA, No 50, 1989), but the situation is becoming constantly more aggravated. We might remind the readers that each power unit has four steam

generators. And if one of them "flies away," it is more convenient to change all four of them at the same time.

However, it's easy to say "change them," but it is not clear where we should put the unserviceable ones or what we should do with them, since a steam generator is a device in which there is an accumulation of high radioactivity, and therefore it cannot simply be thrown on the dump heap—it would seriously pollute the environment. Everyone who has operated VVER-type units has encountered this situation.

The Balakovskaya AES proved to be no exception. After dismantling the steam generators, the people there decided to send them away to be remelted, but... the railroad workers refused to carry the nuclear contaminants to the other side of the world, especially in such a tremendous quantity, contaminating the trains and the entire railroad. The metallurgists also refused the recommendation that they accept the hundreds and thousands of tons of radioactive metal to be remelted.

Only one alternative remained: to decontaminate the steam generators on the spot. But the problem with this was where to put the liquid remaining after the steam generators had been decontaminated. You couldn't just throw it out the windows of the buildings, could you?

In general, the situation that developed at Balakovo indicated that the successful operation of a nuclear power plant requires the construction nearby of small metallurgical plants that would be previously doomed to play the role of lepers, or, to put it more accurately, persons who had been radiated, the output of which plants could be used, for example, to manufacture containers for the radioactive waste products.

The leadership of the Balakovskaya AES took the path of deciding to avoid the difficulties that had arisen by simply... quietly shutting down the steam generators on the territory of the power plant. ("And issued the order to have them buried somewhere," as the song goes.) In other words, they decided to contaminate the ground water, inasmuch as the ground water is very close to the surface there. No one knows how all this would have ended if the Greens had not raised a ruckus and disrupted the carrying out of Operation Memorial.

Soon the Rostovskaya AES will also come up against the same problem, if, God forbid, that nuclear power plant is activated. The ground water there is also very close to the surface, just as it is in Kostroma.

Putting it briefly, the problem of burying the steam generators is a problem that is shared by all the nuclear power plants that operate VVER power units. And it is becoming aggravated with every passing day thanks to the fact that, as a consequence of design shortcomings, the total service life of the PGV steam generators is not the specified 30 years, but only two or three years. As is indicated by arithmetical computations, during the 30 years of operation of a nuclear energy plant (and on the basis of the present-day situation this is its maximum

"life"), each energy unit will have to bury from 40 to 60 steam generators, each weighing 400 tons.

At the present time, special burial grounds are being built for this purpose at the South Ukrainian AES, with the cost of one PGV burial ground being more than 200,000 rubles.

Already the direct and indirect losses from the production and operation of the PGV steam generators are rapidly approaching a billion rubles. Obviously, they will continue to increase.

And yet the designers were supposed to provide for different alternatives for dismantling and decontaminating the steam generators, just as they were supposed to provide for the dismantling of the nuclear power plant itself and the decontamination of its large-sized equipment. But, unfortunately, the irresponsible practice of nuclear power development in our country is carried out under the strictly materialistic slogan "If we die, the burdocks will grow."

And, sure enough, they have grown, and they are radioactive...

But what about the leadership? Do you think that they are sleeping? No, the leadership, as they used to say in the city of Glupovo [Stupidtown], "is sleeping with one eye shut, but can see everywhere with the other one." And it really does see. For example, on the very eve of 1989 N. I. Ryzhkov requested USSR Academy of Sciences and his ministers, particularly L. D. Rebev, who at that time occupied the position of minister of medium machine-building, to explain to the government what was being done with the steam generators. However, so far as I know, the Council of Ministers did not receive any answer to that request, and, as is customary, in view of the lack of such answers, no guilty individuals were discovered.

True, in one of his findings, V. I. Subbotin, chairman of the USSR Academy of Sciences Commission for the Safety of Nuclear Power Plants, stated that the operation of the PGV-1000 can result in a major accident at a nuclear power plant. But one must assume that these papers were not very interesting to anyone, or, if they were interesting, it was not sufficient to make any decisions concerning them, much less to carry out those decisions.

Meanwhile on 5-9 March 1990 in Berlin (West Germany) there was an international conference of the countries that are "operators" of VVER-type nuclear power plants. USSR representative G. Tarankov who spoke at that conference, referring to a report given by the chief designer of the steam generators, remarked that from October 1986 through March 1989 twelve steam generators had gone out of commission at the VVER-1000 units (we might recall that the cost of connecting and installing the four steam generators is approximately 25 million rubles, plus approximately 40 million rubles of losses from nonproduction of electric power—TRUD,

21 April 1990). However, if G. Tarankov had not limited himself to last year's data and had not been too embarrassed to publicize the 1990 information that, one must assume, he has available, the non-Soviet participants of the conference would have learned that, as a minimum, 26 steam generators have already gone out of commission.

Nor did our chiefs get any temptation to make a trip to the Podolsk Machine-Building Plant imeni S. Ordzhonikidze, where the steam generators are produced (just as they are produced at the Volgodonsk Atommash Plant) and where V. F. Grebennikov is the director.

While the people at the nuclear power plants are racking their brains about where to put the unserviceable steam generators, and at some of which pits are already being dug, V. F. Grebennikov prepared at the Nuclear Power Engineering Department of Moscow Energy Institute, which department is headed by 1989 USSR State Prize winner Professor N. G. Rassokhin (who, incidentally, received it for his textbook on unserviceable steam generators), a doctoral dissertation. If God is willing, Comrade Grebennikov will receive the degree that he seeks—the degree of doctor of technical sciences—by overcoming all the VAK [High Degree Commission] obstacles, roadblocks, ambushes, escarpments, and counterescarpments! The statement concerning the introduction of the long-suffering brainchild that is so dear to his heart is absolutely genuine! And the introduction is not fake, but done in absolutely physical terms. True, the “economic benefit” from its introduction will cost the country several billion rubles worth of losses. But the crux of the matter is not in the losses, but, rather, in the introduction and in the practical significance of the doctoral dissertation. In general, it cannot be said that the people in the government do not know that the situation with the steam generators is suspicious. Either they know it or, at least, can guess it. But they are not taking any steps to correct it. None have been visible so far.

But if the situation with the steam generators seems to some to be unconvincing in view of its ordinariness, I can give another example.

As everyone knows, the Volgodonsk Atommash Plant (previously, imeni L. I. Brezhnev) began crashing down, in the most literal sense of the word, into the ground, inasmuch as it had been built on soil that is not suitable for the construction of a gigantic plant. It turned out, however, that there was no one to hold accountable for the collapse: the designers had flown off in all direction: some to Israel, others to America. Despite this fact, right next to Atommash, on the very same quicksands and karsts, the Rostov AES is ready for activation at any moment. And also, right next to Atommash, on the very same quicksands, yet another gigantic construction project is being built—Energomash.

As long ago as 27 March 1985, in his letter to USSR Council of Ministers, No. 516-P, N. K. Baybakov, who

was at that time USSR Gosplan chairman, emphasized the undesirability of building that plant in view of the fact that “the allocated construction site has soil types that are unstable and are strongly compressible, the existence of which leads to a considerable increase in the construction costs and does not guarantee the reliability of the buildings or structures to be operated.”

And what has changed since then? Nothing. They are still building the way they were then.

The fact, nevertheless, proved to be so curious that certain KGB operational workers thought that it was economic sabotage. But, apparently fearing the possible accusations of inciting espionage mania, they simply sighed and waved it away.

Well, to Hell with those steam generators! Has anyone been held responsible for Chernobyl? Or can we, with the most serious expression on our face, assert that the chief culprit in that colossal catastrophe is the power-plant director?

Has any of the experts on the Governmental Commission been held responsible for reducing by an entire magnitude the scope of the Chernobyl catastrophe? Or our government?

As has turned out by the fourth anniversary of Chernobyl, a rather large number of claims against the government and the Politburo have accumulated in society...

Yu. A. Izrael, Goskomgidromet [State Committee for Hydrometeorology] chairman, has heard many accusations leveled at him with regard to Chernobyl—accusations of reducing the scope of the Chernobyl catastrophe, deliberately misinforming the public, keeping information secret, etc. And he complained about this on the pages of PRAVDA (17 April 1990). Many people probably will also remember last year's procedure for confirming Yu. A. Izrael to the position of minister in USSR Supreme Soviet, which procedure occurred in an extremely stormy manner. Many will also remember how bravely Yu. A. Izrael was defended against the “unsubstantiated attacks” of a number of “immoderately” zealous deputies by N. I. Ryzhkov himself. And no one, after the confirmation of Yu. A. Izrael to his ministerial position, apparently doubted the fact that Yuriy Antoniyevich owed everything to Nikolay Ivanovich and that, to his dying day, he would be thankful, or at least grateful, to him.

But not even a year passed when, at a discussion of the problems of Chernobyl in USSR Supreme Soviet, Yu. A. Izrael suddenly “surrendered” Nikolay Ivanovich, stated that all the “reliable information about the actual situation at the Chernobyl AES and in the rayons that had suffered from the catastrophe had been sent to the leadership of the union government and, in particular, to N. I. Ryzhkov.

“As early as 2 May 1986, at a meeting of the governmental commission on Chernobyl, Goskomgidromet

representatives insisted, as Yu. A. Izrael asserts, that the inhabitants be evacuated from the entire 30-kilometer zone. However..." (IZVESTIYA, No 106, 1990).

That is the kind of ingratitude with which Yuriy Antoniyevich repaid Nikolay Ivanovich... However, even this does not remove the responsibility from the minister, since he had downplayed the data, and our premier, if one is to believe this information, "merely" slapped the word "Secret" on that data. The results of those operations are already known to the entire world—the loss of the health of hundreds of thousands of people. And, once again, no one of those persons bore any responsibility for that.

And what should be done with the Turkish tea, that was grown on the Chernobyl fallout and that is piled high on our store shelves? Because it is no secret that Turkey demanded compensation from the Soviet government for Chernobyl. So we are buying exceedingly radioactive tea...

And here is yet another curious example. At one of the meetings with the residents of Nizhniy Tagil that was held in late April, the USSR President was asked whether he felt any personal responsibility for Chernobyl or the obvious delay in taking steps "to eliminate its consequences."

The question evoked in M. S. Gorbachev obvious perplexity. Actually, as becomes obvious from recently published articles, in 1986 the system of collective state-political irresponsibility still prevailed in our country. Did it cease to exist after the introduction of the institution of the presidency?

Until we answer that question, all the claims leveled against the highest officials, if the event that, once again, "God forbid, there might be a big bang somewhere," will be senseless.

Incidentally, in July 1986, by a Politburo decision, A. G. Meshkov, first deputy minister of what was then medium machine-building, "because of his major errors and shortcomings in his work, which led to an accident with serious consequences," was relieved of his duties in the position he occupied, and, as people used to say in the olden days, "with the publication of said fact." Last year A. G. Meshkov was restored to his previous position, albeit without "publication."

A special topic is the classifying of information, the consequence of which, as a rule, is the formation of a narrow group (clan, Mafia) that monitors the information going "to the top" and "to the bottom." This creates the opportunity for deliberately misinforming both the government and the public, and this, in the final analysis, leads to the degradation of scientific developments, to the degradation of the associates' morale, and to outright crimes.

As a result of the closing of the information channels it is possible to create, and quite often there is actually

created, a situation when neither the government nor society knows the true state of affairs and both are kept completely in the dark, while the whole scenario is run by one departmental clan or another. The government is misinformed through one set of channels, and the public through another.

The way in which society is misinformed could serve as the plot of detective stories. Therefore, for lack of space, we shall limit ourselves only to a few examples.

V. P. Antonov, the previously mentioned head of the Laboratory of the Antiradiation Protection of the Population, All-Union Scientific Center of Radiation Medicine, USSR Academy of Medical Sciences, asserts in his pamphlets that were blessed by Ukrainian SSR Minzdrav and USSR Goskomatom that the half-life of the long-lived radioactive elements can be reduced by "zoning the agricultural and land-reclamation operations" and much, much more (V. P. Antonov, "Radiatsionnaya obstanovka i yeye sotsialno-psikhologicheskkiye aspekty" [Radiation Situation and Its Sociopsychological Aspects], Kiev, 1987). But could this simply be flagrant ignorance?

And this is what, for example, Yu. V. Petrov, doctor of physical-mathematical sciences from Gatchina, writes: "...both in the production and obtaining of energy and the removal of waste products, uranium proves to be the fuel that is least influential on the environment (author's emphasis)" ("Yadernaya i termoyadernaya energetika budushchego" [Nuclear and Thermonuclear Power Engineering of the Future], Schoolchild's Popular-Science Library, Moscow, Energoatomizdat, 1987, p 175).

However, as is attested to by practical life, the activity rate of the fuel that has been depleted in a reactor exceeds by a factor of millions (yes, millions!) the initial activity rate of uranium.

Somehow it is awkward even to suspect the Gatchina physicist of this vulgar distortion of the "multiplication table," or could it be that he has simply forgotten his physics?

So, has anyone been held responsible for the criminal policy of locating nuclear power stations in our country? No!

Has anyone been held responsible for the extremely unsatisfactory supplying of medicines to the population that has suffered? No!

Have the conditions been created for a new Chernobyl? Yes!

You might recall the words of the revolutionary song: "'We are fanning a worldwide fire... We shall bring the churches and prisons down to the ground!' Well, the churches have indeed been brought down to the ground, but for some reason there definitely has been no shortage of prisons, and there also has been no increase in

responsibility. But, even after Chernobyl, you cannot intimidate anyone anywhere nowadays by the threat of prison.

Chernobyl!... Has any of the responsible workers been held completely responsible, has any of them been held accountable for the loss of two million hectares of agricultural land? Has any of them asked himself how we are supposed to continue living and what we shall eat?

No one has been held responsible, and no one has even thought aloud about this... Because none of them lost anything from Chernobyl. Who do those millions of ruined hectares belong to? No one. That's to say, they belong to the entire nation.

The entire horror and social idiocy of the situation that has been created consist in that the interests of the representatives of the authority, and the authority itself, have not been affected by Chernobyl or the losses of the land.

And if it were not for the grumbling and indignation, the letters and complaints, and the tears and the wailing of the people who suffered from Chernobyl and who are defending their right to life and existence, none of the representatives of the authority would even flinch. And why should they? So, if we want to create a system of responsibility, we must also create a system of real ownership.

"Well, then, what's to be done?" is the age-old Russian question that arises. It would seem that, in order to create a system of responsibility, it is necessary to define precisely the subject of responsibility, to personify that subject.

That would become possible in the event that the decision to erect a particular nuclear project on a particular territory were made after the conducting of an appropriate referendum.

In the event that that referendum had an outcome that was positive for the nuclear departments, an appropriate contract could be concluded between the local soviets and the appropriate department (preferably with an independent nuclear-power company operating under a system of cost accountability), which contract would govern the procedure and volume of compensation for any material or psychological damages incurred by the public or any damage to its health. That would make it possible to avoid excessive social tension and would make the population of the various oblasts the responsible subjects of the decisions being made, who are voluntarily assuming the risk of any possible consequences, rather than the voiceless objects of political or other manipulations.

On the other hand, this would require the nuclear bearer of responsibility to present information ahead of time concerning his financial capability to pay the extremely probable "accident bills," and to be concerned about the providing of medical support to the region in which the

construction of the nuclear project is proposed. Therefore, the first task in guaranteeing nuclear safety is the creation of the appropriate "accident fund," with that fund being created not at the expense of the taxpayer (otherwise why would that fund be needed?), but at the expense of the nuclear company. Specifically an independent company, operating under a system of cost accountability, since the department will cover its own expenses with regard to accidents, once again, by charging the state budget, that is, at the expense of the nation.

In order for us to have subjects that are actually responsible for their own deeds, including catastrophes, it is also necessary to carry out a fundamental reform of our socioeconomic and political life, as a result of which, in the opinion of Professor Yu. I. Koryakin, cost accountability will be introduced when operating projects that produce power. He feels that it is necessary to take the power capacities, including the nuclear-power capacities, out from under the control of the central departments and to resubordinate them to the local authorities; to introduce payment for the use of natural resources—land and water; to eliminate the central power departments and create on their base construction-design and scientific-research companies that offer on a commercial basis to the local soviets alternatives for resolving the regional power tasks, inasmuch as it is impossible, on the scale of our entire country, to organize the administration of power engineering, including nuclear, from a single center.

However, unless we educate a person with a conscience (a "God-fearing" person) to be the executor and administrator of the nuclear programs, even these measures will be obviously insufficient.

Another condition for guaranteeing a system of responsibility is the existence of superdepartmental, parliamentary overview of the projects with increased danger, and not only nuclear ones. I might be reminded that we already have a kind of such overview, and the example given to me might be that of Gosatomenergotekhnadzor [State Committee for Safety in the Atomic Power Industry] (GAEN).

However, essentially speaking, no one can order GAEN to do anything, and any paper that is ejected from deep within it must be coordinated with those very same departments that that paper is intended to bring to reason. It is interesting to know what you, my dear reader, would say if our Supreme Soviet, when adopting a Criminal Code, would begin to coordinate those articles with criminal repeat-offenders.

Nor should we forget the fact that by no means all of the nuclear-power units are under the supervision of GAEN, but only those that previously, that is, prior to 1986, were under the jurisdiction of Minenergo [Ministry of Power and Electrification]. Thus, all my attempts to find out at GAEN whether a major accident had actually occurred in March 1989 at the Shevchenkivskaya AES

proved to be unsuccessful. "We don't know. It's not our reactor," I was told by GAEN employees who were obviously puzzled and embarrassed by my question.

The conclusion suggests itself: GAEN, like Goskomprirroda [State Committee for Environmental Protection], must be taken out of subordination to the Soviet of Ministers and they must be subordinated directly to USSR Supreme Soviet and the Congress of USSR People's Deputies.

The next important element in the system of our nuclear nonsupervision is the lack of any safety legislation, including legislation pertaining to nuclear safety. For that reason it is necessary to introduce urgently into the USSR and RSFSR Constitutions articles pertaining to safety that guarantee USSR citizens the protection of their life and health in the event of serious accidents, including nuclear ones.

In conformity with the constitutional standards, it is also necessary to develop precisely worded legislation concerning safety. Only in this instance will the agencies of technical overview, for example GAEN, having become an agency of the USSR and RSFSR Supreme Soviet, be able to carry out their functions that are vitally important to society, by relying on the law, rather than upon departmental decisions and resolutions that have been "coordinated" and thus are often completely irresponsible, and that completely destroy the idea of strict state nuclear supervision.

Finally, it is necessary to develop the ideology itself for nuclear supervision: at the present time that ideology simply does not exist. Incidentally, this does not trouble anyone in the leadership. On the contrary, it creates favorable opportunities for mindless branch expansion.

The ideology of supervision must include the idea of the issuing of a license from USSR Supreme Soviet or the Supreme Soviet of the union republics for the construction of a nuclear or other dangerous project (chemical, etc.). Obviously, the license can be issued only after an outcome of the referendum that is positive (for the nuclear company).

This would mean the creation of a system of making a state decision with regard to the construction of a particular nuclear (or other dangerous) project.

The license must be issued not only for the erecting of the project itself, but also for the individual stages of operations, such as the choice of the construction site, the bringing in of nuclear fuel, operation, and removal from operation.

There must also be supervision in the process of construction. The ideal situation must be the following: one company builds, and another supervises the first company. That's expensive, of course, but it has to be done: people's lives and the country's security are more expensive. Or, rather, they are priceless.

It must also be clearly understood that, under the conditions of a universal shortage of financial means and products of production, our departments do not have a self-interest in increasing the severity of the safety standards, which leads to the investment of considerable funds. Unfortunately, in our society the state produces, and it also supervises itself. Under these conditions, there can be no discussion of any system of responsibility and safety. Therefore, in order to guarantee our safety, it is necessary to carry out a fundamental economic reform, as a consequence of which the subject of production would be independent companies operating under the principle of cost accountability, the activities of which will be supervised by the state. It is precisely the state that must create the system of "stick discipline," a system of the strictest supervision of production safety.

And if one considers the fact that most of the joint enterprises, a number of which represent a direct threat to our national security, are being built in RSFSR, the Russian parliament will have to create within the shortest periods of time its own republic-level system of legislation dealing with ecological and other types of safety, which system is possibly even more rigid than the unionwide system, and also to discontinue temporarily the action of all the international agreements that affect the interests of Russia, with the purpose of ascertaining their acceptability to Russia. Because it is precisely in Russia that the enterprises for processing the nuclear waste products from the nuclear power plants are situated. It is precisely in Russia that it is proposed to begin building graveyards for radioactive waste products, including waste products shipped in from abroad.

Therefore it is necessary within the shortest periods of time to consider the question of the possibilities and conditions for exporting electrical power from Russia to foreign countries and to other union republics, as well as for receiving from Lithuania (the Ignalinskaya AES) depleted nuclear fuel. However, this will be possible only under conditions when Russia has changed over to republic-level cost accountability and the law governing the national sovereignty of RSFSR and republic laws governing the land and property have been adopted.

Problems that are no less important are the creation of rigid republic legislation governing joint enterprises, as well as the working out of a strategy for Russia's foreign-economic cooperation with foreign countries on mutually advantageous terms, and the most rapid reconcluding of USSR and RSFSR treaties with the interested countries concerning the returning to us of depleted nuclear fuel.

We might recall that the Russia that was bequeathed to us by our ancestors is not Europe's dumping ground. And if the all-union departments do not understand this, it would be better for them to transfer their bases somewhere else, to other places—outside of Russia.

Nuclear Waste Burial Cited as Possible Volga Quake Cause

PM2808144190 Moscow IZVESTIYA in Russian
18 Aug 90 Morning Edition p 6

[Article by M. Piskunov, ULYANOVSKAYA PRAVDA oblast newspaper correspondent, plus editorial commentary, under the rubric "Committed Reporting": "Tracks Lead to Testing Ground?"]

[Excerpts] Inhabitants of Dimitrovgrad in Ulyanovsk Oblast have been alarmed by unusual earthquakes—an unusual phenomenon for the Middle Volga. The city was shaken strongly by underground tremors in the middle of summer. In the absence of a reply from the authorities and specialists, the journalist tried to conduct his own investigation. [passage omitted].

Immediately after the first underground shock, the city's civil defense headquarters gave a report via the local newspapers. It ran as follows: The appropriate city services have carried out reconnaissance of the area, but no external factor capable of causing a tremor has been detected. The reason for its taking place is unknown...

The gorispolkom [city soviet executive committee], it seems, was not too concerned with investigating the unusual phenomenon. Neither have representatives from industry or the nuclear power industry made an official statement.

What have nuclear power specialists got to do with this? The point is that, in searching for the reasons for the Dimitrovgrad earthquakes, I unexpectedly managed to get out to the Scientific Research Institute for Nuclear Reactors, or more precisely to its testing ground for burying radioactive liquid waste, which is located right in the area where the underground elemental manifestation occurred. At one time the USSR Ministry of Geology was involved in creating the testing ground. The Scientific Research Institute for Nuclear Reactors' actual "boss" is the Ministry of the Nuclear Power Generation and the Nuclear Industry. Until recently the testing ground operated under the "secret" stamp. Last year the veil was finally lifted.

Leaders of the Scientific Research Institute for Nuclear Reactors claim that all is quiet at their testing ground and they consider the liquid waste deep burial method itself ecologically safe both to the environment and people's health. [passage omitted].

And what is the composition of the solutions being pumped at the testing ground? It transpires that liquid waste from all the facilities of the Scientific Research Institute for Nuclear Reactors' industrial site converges here as if in a slop bucket. In this way not only a large quantity of water is forced into geological formations, but also all kinds of chemicals, including radioactive substances, together with it. So just what is going on down there in the depths of the earth? What processes or chemical reactions could occur? There are, alas, no precise answers to these questions.

The following question probably occurs to readers: How do they handle liquid radioactive waste at the country's other nuclear facilities? The majority of AES's [nuclear electric power stations] do not use the method of pumping them into deep earth strata. They use completely different methods, including evaporation.

But let us return to the Dimitrovgrad testing ground. Familiarizing myself with the literature on the immediate problem, I studied the book "Contemporary Problems of Nuclear Science and Technology in the USSR" ["Sovremennyye problemy atomnoy nauki i tekhniki v SSSR"], published in 1976. The work's author, A. Petrosyants, who at that time occupied the post of chairman of the State Committee for Utilization of Atomic Energy in the USSR, was convinced of the economic advantages of the deep underground burial of radioactive liquid waste and cited as an example the very same Scientific Research Institute for Nuclear Reactors testing ground. But lo and behold, comparing his information on the lithological structure of the burial zone with a document—a geological section of the well, I discovered, to put it mildly, contradictions giving rise to grave fears concerning, for instance, the waste burial depth.

So is it permissible to continue the practice of deep burials of radioactive liquid waste as is done in Dimitrovgrad? It would be nice to believe that an appropriate ban will follow. But this threat of calamity will remain. If karstic processes now leak through to the depths under the testing ground or some sort of chemical reaction occurs, what guarantee is there that they will stop in the next few years?.. That the worst will not happen?

Alarm is heightened by the fact that burial grounds for highly radioactive solid waste are located literally next to the testing ground and the nuclear reactor buildings are just a little further on. And there are eight of them in Dimitrovgrad, including seven in operation!

I would be glad if the version given here of the reason for the Dimitrovgrad local earthquakes is not confirmed. Be that as it may, in the light of the facts disclosed the testing ground's fate must be decided urgently.

From the Editor [passage omitted].

Prior to publication we showed the report to specialists.

This is how A. Rybalchenko, research laboratory chief at the VNIIPromtekhnologii [possibly All-Union Scientific-Research and Design Institute of Industrial Technology], and D. Levitskiy, a leading engineer at the institute, interpret the situation: "First of all, underground tremors in Dimitrovgrad measuring up to Force 5 make it necessary in any case for a special interdepartmental commission to study the reasons for these phenomena. But currently there are no objective data enabling these phenomena to be linked to the burial of the Scientific Research Institute for Nuclear Reactors' industrial effluent. Research conducted since 1966 at the industrial effluent burial testing ground likewise does

not permit such a conclusion to be made. For a thorough evaluation of the possible reasons for the occurrence of seismic activity it is necessary to analyze data on natural earthquakes occurring in the last 10-15 years in neighboring regions (the Tatar ASSR [Autonomous Soviet Socialist Republic], Kuybyshev Oblast, and others)... It is necessary to examine in detail the data from observations of the status of absorption levels [pogloshchayushchiye gorizonty] actually at the testing ground, which did not show marked anomalies during the period of the earthquakes. The effect of filling up the Kuybyshev Reservoir on the geostatic equilibrium must also not be excluded from consideration.

"We consider it necessary to set up a seismic station in this rayon and involve in this work the USSR Academy of Sciences Institute of Earth Physics, which has experience of conducting research at similar facilities."

... One thing is clear: Letting the "earthquakes" in this city go undetected is criminal. The editor hopes to return to the problem raised in the report after thorough research of this testing ground's current condition by specialists.

Construction of Gorkiy Nuclear Heat-Supply Station Halted

*PM2808123990 Moscow IZVESTIYA in Russian
25 Aug 90 Morning Edition p 2*

[A. Yershov report: "Construction of Nuclear Station Halted"]

[Text] Gorkiy—A Gorkiy Oblast Soviet session has adopted a decision to ban further construction of a nuclear heat-supply station near the oblast center.

The station is located virtually inside the city limits, but the public believes that adequate guarantees that its future operation will be safe are not provided. Nor is it possible to disregard the population's psychological state after the Chernobyl Nuclear Power Station accident.

A final decision on the fate of the Gorkiy Nuclear Heat-Supply Station will have to be made by the country's government.

Maj Gen Safonov on Semipalatinsk Nuclear Test Range Controversy

*90UM0752B Moscow KRASNAYA ZVEZDA
in Russian 17 Jul 90 p 4*

[Interview with Maj Gen F. Safonov, deputy chief of the Semipalatinsk range, under the rubric "A Topical Interview": "The Semipalatinsk Range: Forecast for Tomorrow"]

[Text] The debate surrounding the Semipalatinsk range continues unabated. Only recently this problem has been discussed at two press conferences in Moscow, in articles in the press and on Central Television programs. The matter was also brought up at the 28th CPSU Congress.

What are the latest assessments of the situation and the proposals for resolving it? This was the subject of an interview conducted with Maj Gen F. Safonov, deputy chief of the range, by our correspondent.

[Correspondent] Fedor Fedorovich, we know that a representative, interdepartmental commission headed by A. Tsyb, corresponding member of the USSR Academy of Medical Sciences, worked at the range last year. Doubt was cast upon their conclusions, however, by activists in the Nevada-Semipalatinsk movement and by some of the residents of oblasts adjacent to the range. Where does the truth lie?

[Safonov] Let us recall that in addition to this commission, the Americans also took measurements at the range. And the Union deputy group was there quite recently. All of them concluded that the technology for underground testing has now been refined to the point that it poses no threat to man or the environment. Their conclusions were not accepted, however. The range is not a dance floor, of course. The finishing touches are made on awesome weapons there. It was dangerous only during the period of surface testing, however. That is, until 1963.

[Correspondent] But there was still an escape of inert radioactive gases to the surface in February of last year.

[Safonov] One can hardly talk of any sort of serious danger in connection with this. The temporary rise in the level was only five milliroentgens. What does this mean? We receive about the same exposure on a flight from Semipalatinsk to Moscow. We have still taken a number of steps to prevent even this, however. They include placing the charge at a greater depth, carefully studying the geology of the soil and thoroughly concreting the head of the hole. There is still the seismic effect to consider. It can be lowered, however, by reducing the size of the charge. I would also stress the fact that our range has an advantage over the Nevada range, where the radioactive level is four times higher. No one there is calling for its closure, however, except for periodic statements by the Greens.

[Correspondent] This is perhaps because information on the explosions is more accessible there? It was reported at the latest press conference in Moscow, for example, that only 80% of our information for the Semipalatinsk Special Health Center has been declassified. A map of the radiation situation has still not been published...

[Safonov] I am against this kind of supersecrecy. Particularly since, as far as I can see, the material contains nothing out of the ordinary. This is more a matter of inertia of thinking. And so, we should open up the other 20% of the information. This would deprive opponents of the range of many trump cards. I understand, however, that this decision is the prerogative of the USSR Ministry of Health. With respect to a map of the radiation situation, the decision has already been adopted in

the Ministry of Defense to publish one. It will be published with the necessary explanations in the near future.

[Correspondent] I have the impression that, as usual, we are late in doing so. The Karaganda miners have included in their package of demands one that the range be closed.

[Safonov] To some degree that apparently has to be admitted. A fact which, incidentally, certain informal organizations are skilfully exploiting to their own ends. As a result, the situation surrounding the range has gone from an environmental to a political one. It was assessed from this standpoint also by certain delegates at the congress. This is despite the fact that the oblast's chief sanitary doctor stated in the 13 May 1990 issue of the newspaper IRTYSH that the radiation level around the range is normal. With respect to the congress, I addressed it with specific proposals for getting out of the impasse, which were coordinated with activists in the antinuclear movement and at the final stage, with the nation's government. What did they consist of? A proposal was introduced and approved for a government commission be set up with the participation of foreign experts. It would once again thoroughly evaluate the radiation situation at and around the range and determine whether the tests being conducted are dangerous. A second proposal was that a subcommittee be set up under the Committee on Ecology and the Prudent Use of Natural Resources, which would perform legislative work. What kind? The preparation of normative enactments for assessing the safety of all military facilities with a heightened danger in general and the drafting of laws for their startup and operation and for ensuring safety and providing benefits and preferential status for individuals working at them and those residing in the zone of recognized risk. General civic interests and not departmental ones would be taken into account.

[Correspondent] The last question, Fedor Fedorovich: An international congress on the banning of nuclear testing was held in Alma-Ata in May at the initiative of the Nevada-Semipalatinsk movement. Did it produce any kind of specific results?

[Safonov] We heard once again the official position of the USA on the matter. Eugene Carroll, head of the American delegation, expounded it: "We do not regard nuclear testing as an evil which must be stopped. On the contrary, we consider it to be a means of national security." There you have it. I would add to this the fact that the Bush Administration informed the congress that the USA must continue its nuclear testing for at least 10 years. That is, until the 21st century. We could pretend that we are unaware of this, of course. But would we not be hiding our heads in the sand?

If we have no confidence in the findings of the Tsyb commission or the conclusions of the Union deputy group, let us believe what an independent—government, if you like—international commission would have to

say. Let us be intelligent. We have learned well how to destroy and break up things in 70 years. It does not take a lot of intelligence or ability to destroy a range which cost billions of rubles. Let us consider very carefully before taking such a step again. And let a deliberated approach, thorough assessment and thrifty consideration for the people's money predominate in the decision, and not pride and political ambitions.

Public Appeal On Ochakovskiy Rayon Radar Dangers

90UM0740A Moscow SEMYA in Russian No 25,
18-24 Jun 90 p 11

["Appeal From The Residents of Ochakovskiy Rayon, Nikolayev Oblast"]

[Text] The editors have received a great deal of letters on the subject of ecology. One of them is an appeal for urgent assistance.

We are appealing through the newspaper SEMYA to the USSR Supreme Soviet that it halt the operation of radar stations in our area.

We have previously appealed to USSR Minister of Defense D. Yazov, to the All-Union Central Council of Trade Unions, and to the Ukrainian SSR Supreme Soviet, but none of our letters have been answered. After we sent a telegram to the Global Forum on Ecology in Moscow, we were visited by a commission from the Kiev Military District. On January 17, 1990, measurements were taken of the intensity of the flux of high-frequency electromagnetic radiation. We learned from the readings that the intensity of the flux [potok] in our area exceeds the allowable norm by 200 percent to 300 percent.

The radar units are located 800 meters away from residential buildings and a few hundred meters away from two sanatoriums. One of them treats 6,000 people each year, the other 1,200 children. Many come for treatment from the Chernobyl area and are exposed to radiation again!

How could it happen that residential buildings, a kindergarten, and a school were built next to the radars? Why weren't the radars removed before construction started? Why did former first secretary of the rayon party committee Fomin, chairman of the rayon soviet executive committee Izuita, sanitary and epidemiological station chief physician Sergiyenko, rayon hospital chief physician Aleshkov, and other top officials do nothing when the construction had only just begun?

At present, most of us show heightened sensitivity to catarrhal illnesses. We have constant headaches and other ills. Kindergarten No. 1 has the highest incidence of child sickness in the rayon. (The kindergarten is in immediate proximity to the radars).

We have been told that the radars will be removed in two years. That prospect doesn't satisfy us. If they cannot be removed soon, they must be shut down, as was done in

Dzhezkazgan. If shutting down the radars harms the country's defenses, we demand that screen grids be placed in front of our homes. This must be done as soon as possible. By the time all the pros and cons are weighed, the loss of health for many of us will be irreversible."

[Signed] Initiative group members A. I. Ryzhakov, V. A. Khramtsov, L. G. Markov, and 2,000 other signatures.

Tree Damage Blamed on Space Launches

PM2808131190 Moscow Television Service in Russian
1430 GMT 26 Aug 90

[From the "Vremya" newscast: Report by V. Bogomolov, identified by caption]

[Excerpt] [Passage omitted, video starts after 23 minutes 11 seconds elapsed time with interview with V.F. Tsvetkov, deputy director of the Forestry and Wood Chemistry Institute, identified by caption]

[Tsvetkov] This spruce blight can also appear on larches.

[Bogomolov] What about the affected fields? The poplar blight?

[Tsvetkov] The leaf and wood [word indistinct] are carried into the forest. There can be cases of any type of blight and disease, including all kinds of infestation by harmful substances carried by precipitation.

[Bogomolov] Including space-related substances?

[Tsvetkov] That isn't ruled out, of course.

[Bogomolov] Of course, the spruces may just be sick. But it's not just the spruce trees. These berries and mushrooms may be poisonous too. Because more and more Pinega residents are voicing the opinion that the trouble came from the skies over the taiga, after a rocket launch from the Plesetsk Cosmodrome. [Bogomolov had noted previously that the spruce trees started turning yellow "about two weeks ago"] Following the launch there was a yellow mist in the morning. A yellow rain fell and a yellow scum remained on the surface of the Pinega River for a long time. What happened on the banks of the taiga river? Is it an echo of the trouble that affected the White Sea in May? Both then and now the scientists just shrugged their shoulders. And we just don't know the truth.

Investigation of White Sea Environmental Disaster Updated

White Sea Protection Urged

90WN0191A Moscow POISK in Russian No 26,
29 Jun-5 Jul 90 p 8

[Article by POISK correspondent Arkadiy Sosnov, under rubric "Details for POISK": "Why the Starfish Are Dying..."]

[Text] The press has already reported on the mysterious ecological catastrophe on the White Sea. A "graveyard" of

starfish and crabs has been discovered for a distance of approximately 40 kilometers along the southern shore of Dvina Bay. The density of the dead starfish is as many as 300 starfish per square meter, and of crabs, 17. In early June the dead bodies of seals appeared on the shore. More than 50 of them have been found. Observers noticed the anomalous behavior of certain seals: spasms and sluggishness. Moreover, animals with similar symptoms were subsequently observed in Kandalaksha Bay. The environmental-protection services of Arkhangelsk were brought to their feet, and a special commission of RSFSR Council of Ministers was created...

A warning message also arrived at the White Sea Biosation of the USSR Academy of Sciences Zoological Institute. It sent the Kartesh scientific-research ship to the area where the animals were dying. The station chief, Doctor of Biological Sciences Viktor Berger, reported to Leningrad that a prolonged gale had hindered the study of the coastal area in the epicenter of the disaster, but on its "periphery" the layer of starfish that had been cast out of the water was 15 centimeters deep. "Among the starfish there are practically no young. The minimal dimension is 5-6 centimeters, and the average is 10-12 centimeters. It appears that the starfish and crabs that live along the shore at depths of 5-10 meters, under the influence of some kind of 'chemistry,' are losing their rate of activity, and perhaps are being narcotized. The starfish, having lost their suction ability, are thrown out onto the shore by the surf. It is very suspicious that this is happening in the interior waters of Dvina Bay..."

According to specialists' estimates, a total of more than 4 million starfish are spread over the sandy shore. But no one yet knows how many are lying on the bottom. That will have to be ascertained by the next expedition, which will include divers with aqualungs. The natural causes of the animal deaths have not been established. It seems, then, that someone had poisoned them. But who, and with what? The subsequent investigation reminds one of a detective story. Samples of the starfish, the soil, the water, and plankton were sent to Leningrad for analysis, including analysis to determine the content of fuel components. A representative of the Northern Fleet confirmed that in December of last year, in an emergency situation, a nuclear submarine had been forced to jettison approximately 20 tons of fuel. But that had happened in the open part of the sea. The animals had died in a place where the Dvina "delivers" the runoff from enterprises in Arkhangelsk and Severodvinsk. The concentrations of heavy metals in the water samples proved to be normal. What remains? Pesticides, dusts, some other kind of harmful organic chemical? The analyses will probably indicate what the cause was, but that will not make things any easier...

I remember when, several years ago, Orest Skarlato, USSR Academy of Sciences corresponding member and director of the Zoological Institute, shared with me his plans for developing mariculture on the White Sea.

Under the scientific leadership of his institute, the restoration of the reserves of the famous White Sea herring and the creation of trout farms began, and the first beds of bivalve mollusks—mussels—were laid. Once every four years, as many as 200 tons of fresh mussels are taken from each hectare of the experimental beds, and this is no less than 20 tons of gourmet food. Skarlato is the scientific head of the GKNT [State Committee for Science and Technology] Project "White Sea," the goal of which is to obtain from the "field" of blue water the maximum amount of beneficial biological output. True, no one yet has grown mussels under such harsh conditions, but, first of all, Orest Aleksandrovich explained, the water in the White Sea is sufficiently clean—that's right, clean! Secondly, the shallow water where the mollusks live is heated up in the wintertime, and the alternating incoming and outgoing tides provide a constant replenishing of the food base for the mollusks—plankton. Of course, the northern winter, which locks the surface of the water in its icy armor, causes a rather large number of problems, but the ZIN [Zoological Institute] specialists have also learned how to grow mussels under the ice.

But now there has been an ecological disaster. Will it be necessary to change fundamentally these rosy plans? The scientist only threw up his hands.

"I can repeat right now that the White Sea is the last relatively clean sea in the European part of the country. When, for the first time, we came up against this 'experiment' in the poisoning of its inhabitants, we were forced to observe the consequences. The starfish (like the crabs) are predators, and they eat a lot of the valuable mollusks, including the mussels that we are raising. But according to data in the literature, if forcible means are used to remove the starfish from the animal community, serious changes occur in the entire biocenosis. Fortunately, there are no mussel beds in Dvina Bay. But we intend to put mollusk beds and fish farms along the entire shore. And without clean water there can be no mariculture. Therefore it is necessary to monitor very strictly the potential sources of pollution and to assure the efficient operation of the purification structures first of all at the major enterprises."

Valentina Kulachkova, candidate of biological sciences and scientific secretary of Project "White Sea, adds, "We are doing everything that is within our power to protect the water. We maintain permanent contact with representatives of the Northern Fleet and with the shippers who are transporting petroleum by sea. But we feel that our efforts alone are obviously inadequate. It is extremely necessary to have a special governmental decree concerning the protection of the White Sea. We hope that by the autumn we can prepare the draft for such a decree and take it to the country's Supreme Soviet."

Cause Still Undetermined

90WN0191B Moscow UCHITELSKAYA GAZETA
in Russian No 28, Jul 90 p 7

[Letter to the editor, with editorial reply, untitled]

[Text] A tragedy has occurred on the White Sea. Millions of denizens of the sea have died. But an unforgivably small amount has been said and written about this. What was the cause of this latest in a series of natural catastrophes? What is its true scope?—S. Korobeynik, teacher, Vologda Oblast.

We made telephone calls to several ministries that are taking part in investigating the reasons why animal life is dying in the White Sea—starfish, fur seals, birds... But no one—not RSFSR Goskompriroda [State Committee for Environmental Protection], not USSR Minrybkhov [Ministry of Fisheries], not USSR Ministry of Defense, not USSR Academy of Sciences—provided an intelligible answer. By collecting the crumbs of information about what had happened, it was possible to obtain a picture of the more than tragic situation.

The sea has already cast up onto the shore more than 10 million starfish, hundreds of fur seals, seals, dolphins, nerpas [fresh-water seals], crabs, and birds. The entire Summer Shore, 60 kilometers long and 6 meters wide, is covered with the dead bodies of mollusks and animals. Very rare representatives of marine fauna are dying. The reasons for their dying are unclear. The water in the sea is normal. In the course of the investigation, what would appear to be the most improbable explanations are appearing. One of them is that British interventionists are to blame. In 1918 they threw into the sea barrels filled with poisons, which are allegedly still lying on the bottom of the sea.

There was also an "inoffensive" explanation: overpopulation. However, that explanation has not found its scientific confirmation. The explanation given by MGU [Moscow State University] biologists concerning the broken biological food chain requires careful research of the fauna inhabiting the bottom of the sea.

But while the numerous scientific and quasi-scientific expeditions are giving their own explanations, the unhealthy sea is ejecting everything that used to breathe and live in it only yesterday. The tragedy continues.

Speculation Reviewed

90WN0191C Moscow TRUD in Russian 3 Jul 90 p 2

[Article by TRUD correspondent A. Petrov, Arkhangelsk, under rubric "We Report the Details": "Why the Starfish Are Dying"]

[Text] In December of last year, in the eastern part of the White Sea, an accident occurred on a Soviet submarine. To save the ship and prevent the crew from being killed, the command element authorized the crew to dump into the sea from 8 to 16 tons (the precise figure is never mentioned) of a missile-fuel component. Residents of

Terskiy Rayon, Murmansk Oblast, learned of this and sounded the alarm. The story about the accident, with a reference to the communique issued by the military command element, was published on 2 May 1990 in the Arkhangelsk Oblast newspaper PRAVDA SEVERA. A week later the first ejection of a tremendous quantity of starfish onto the shore of the White Sea occurred. Then there was a second, and in early June a third. A total of approximately 5 million starfish have died. Public opinion is disturbed: was the missile fuel the reason for the ecological catastrophe?

Incidentally, a good dozen of other explanations and suppositions exist, as well as many more rumors. Of course, they are not among "the most reliable" sources. People started saying that in the neighboring Mezenskiy Rayon there have been unexplainable instances when animals and poultry have died. Those warning messages were checked by workers at the oblast environmental-protection committee. It proved to be a false alarm. Then the committee received materials mentioning the "burial of chemical shells in the White Sea," which allegedly could serve as the reason for the ecological catastrophe. The name of one of the "witnesses and participants" in the burial was even given. But the "witness," it turned out, had absolutely no knowledge of those shells and even threatened to take people to court for falsely accusing him... Recently there were discussions to the effect that the reason why the starfish are dying has been known for a long time by the "higher-ups," but it had been decided to apply the brakes to the matter. How could anyone fail to recall the truism: there are no rumors that are beneficial to us, but only harmful rumors...

Meanwhile there has been an intensive search for the reasons why the starfish are dying. I was told at the oblast environmental-protection committee that a governmental commission has been created. With the aid of the crews of the Kvartsit and Ivan Petrov ships, samples of the water, soil, and marine flora and fauna have been taken, and have been sent for analysis to the Azov Scientific-Research Institute of Fishery, to Leningrad, and to Obninsk, where the appropriate laboratories exist. A search for the causes is also being carried out by local efforts.

The participants in it include the sanitation and epidemiology services, hydrometeorologists, and scientists from the Polar Scientific-Research Institute of Fishery and Oceanography (PINRO). A situation like this has never arisen previous anywhere in the territorial waters of the USSR, and therefore it is no simple matter to find the reason. Various explanations are rejected one after the other: the radioactivity is within the normal limits, the salinity and temperature conditions are normal, the content of a number of heavy metals in the water does not exceed the admissible concentrations... True, analyses carried out by the Arkhangelsk Oblast Veterinary Laboratory have shown that the reaction to the content

of zinc in the starfish is sharply positive, but it is still too early to make any conclusions simply on the basis of that fact.

In addition, autopsies have been conducted on the bodies of two nerpas that were discovered on the seashore. The specialists concluded that the animals had died of heart and respiratory failure as a result of paralysis of vitally important centers. There is, as yet, no answer as to why the paralysis had occurred. The environmental-protection committee has received reports from military units that there had been no operations or accidents this year that could have led to the pollution of the sea water.

But let us return to the accident that occurred in the eastern part of the White Sea last December. The command element of the Northern Fleet, in response to a request from the oblast environmental-protection committee, reported the coordinates of the place where it had occurred. The Ivan Petrov research vessel was sent to the accident area. So we will not have to listen to idle conjectures, but will do better to wait to hear what the scientists have to say.

Navy Criticized Over White Sea Pollution

*PM3008152790 Moscow IZVESTIYA in Russian
30 Aug 90 Morning Edition p 3*

["Interfax" report: "What is Lying on the Bed of the White Sea?"]

[Text] Aleksey Yablokov, deputy chairman of the USSR Supreme Soviet Ecology Commission, has visited the ecological disaster area in the White Sea. He expressed the view that previous commissions investigating the causes of the tragedy in the White Sea had been "scared to aggravate relations with the military-industrial complex."

"We have no knowledge at all of the volume and composition of the pollution from naval bases," he said. "The scrappy data appearing in the press indicate that the pollution, particularly by heavy metals, is very serious. According to available information, there are two areas of the White Sea where toxic substances have been buried. Ships are not allowed to drop anchor there. What is lying on the bed of the White Sea? What state is the environment in? Only the military know this. Scientists no longer know anything." "When the military keep mum about what pollutant experts should be seeking, they are behaving immorally," A. Yablokov stressed.

Controversy Over Leningrad Barrier Project Reviewed

*LD2508210790 Leningrad Maritime Press Service
in Russian 1400 GMT 21 Aug 90*

[Text] According to the architects' design, the dike being built in the Gulf of Finland is supposed to be a reliable shield, protecting Leningrad from flooding. However, over the years of its erection the ecological situation in

the zone has radically worsened. Opponents of construction believe the dike will soon turn the whole Neva estuary into a sedimentation tank of sewage, warn the city of epidemics, and propose doing the same to it as happened to the Berlin wall: to break it up for souvenirs.

However, proponents of the dike consider that, thanks to an original engineering resolution, the dike is not facilitating the buildup of sewage at the Neva estuary. In their view the problem lies in the deficiencies of the city waste treatment plants or in their lack of efficiency, and in the outdated equipment of Leningrad plants and factories.

Proponents of the dike also adduce other arguments. They recall that the dike has helped relieve the city center of transport, connecting roads across the banks of the Neva estuary, and has made it possible to exploit the coastal regions, where housing units are being built.

Scholarly opinion

A special economic study carried out under the leadership of A. Yakovlev, corresponding member of the USSR Academy of Sciences, was called upon to summarize the unceasing polemic between the dike's proponents and opponents and formulate specific decisions. The commission of the USSR Academy of Sciences Presidium has come to the conclusion that the basic reason for the worsening of the ecological state of the Neva estuary and the eastern part of the Gulf of Finland is the dike, since ecologically and economically the design of Leningrad's flood defense installations was not well-founded.

Taking account of the ecological, medical, and biological risk of the erection of defense structures in accordance with the ratified project, the construction of the dike must be ceased and the building frozen," reads the academicians' conclusion. [no opening quotation marks as received]

In comparison with previous expert studies the conclusions of the latest commission seem unusually sharp. This can be explained: during the time of stagnation the academy felt itself to be the executive of specific charges of the government, rather than a higher academic arbitrator in society.

Trial of former figures and plans of the new mayor

The academic commission proposes raising the issue of the personal responsibility of oblast party and soviet leaders for the pointless waste of funds and the implementation of a dangerous project.

But this is a specific detail. The major question remains: what is to be done with the incomplete dike? After all, the threat of flooding, which has inspired Petersburg writers to literary masterpieces, hangs as before like a sword of Dikeocles [as received] over the city created by the will of Czar Peter the Great. Time, which has turned Leningrad into one of the world's architectural pearls,

simultaneously subjects the city to destructive catastrophes. Today, the foundations of the historic buildings have decayed and any significant flooding will strike the city a blow from which the Palmyra of the North will not recover.

So, perhaps it is better to have this shield than none? All right, the great czar was mistaken in his choice of site for his capital. Will the city leadership of the era of perestroika manage to set this error straight, or will it add another failure of Soviet perestroika to the czar's failure?

Leningrad's new mayor is convinced: It is amoral to build the dike according to the present plan. An explosive ecological situation is being created and colossal amounts of resources are being expended without a check. One cannot invest money into something which could turn into a real catastrophe for the city.

A. Sobchak considers that it is necessary to announce an international competition and carry out further expert studies. Specialists must make a decision. Various options are viable: getting rid of the dike altogether and implementing a local flood defense of the city or else redesigning it and the waste treatment plants, having significantly increased the penetrability of the dike itself. Alternative proposals already exist. Thus, Academician Alferov proposes turning the dike into a bridge and installing gates which will shield Leningrad in the case of flood.

Yablokov, Others Score Marchuk Stand on Leningrad Barrier Project

90WN0247A Moscow IZVESTIYA in Russian 8 Aug 90 Morning Edition p 3

[Article by A. Yablokov, deputy chairman, USSR Supreme Soviet Committee on Ecological Problems and the Optimum Utilization of Natural Resources, corresponding member, USSR Academy of Sciences, and others: "Do Scientists Need a President?: Why G.I. Marchuk, President of the USSR Academy of Sciences, Opposes the Conclusions Drawn by the Group of Scientific Experts Regarding the Leningrad Barrier"]

[Text] We are forced to appeal to public opinion in connection with the unworthy and dangerous "apparatchik dances" which have evolved around the problem of the Leningrad Barrier. A success of reason and intelligence evoking optimism—that was how the discussion by the USSR Academy of Sciences Presidium received the conclusions drawn by the Commission on the Leningrad Barrier, a commission which the Presidium itself had set up. Virtually all the USSR people's delegates from Leningrad took part in this discussion.

The decree passed by the Academy of Sciences Presidium unambiguously stated the following: "The work conducted by this commission is approved," "When determining the further fate of the structures which have already been built, we support the commission's opinion

regarding the accelerated development, on a competitive basis, of alternative variants for improving the ecological situation in the Neva Inlet." The commission proposes to examine and consider the following variants in particular:

"a) Elimination of the barrier and implementation of local protection of the city of Leningrad from floods;

"b) Redesigning the protective and purification structures with a substantial increase in the barrier's 'transparency,' transferring the discharges from the purification structures and facilities to optimally selected places for this purpose and improving the technology of all the systems for purifying and disinfecting the wastewater, including the local systems of purification at enterprises."

The "apparatchik dances" began immediately after the presidium session. Academician G. Marchuk, president of the USSR Academy of Sciences, deemed it possible to personally introduce his own amendments into the text of the decree, which had been adopted in a collegial manner on 12 July 1990. Moreover, these were so substantive that they evoked an avalanche of protests from the participants at the session.

Within a week, however, the president actually went behind the back of the presidium and personally appealed in the name of the Academy of Sciences to the USSR Council of Ministers with a request to set up still another commission of experts, this time an international one, thereby, in fact, casting doubts upon the competence and objectivity of Soviet scientists and the commission members of the USSR Academy of Sciences Presidium.

It should be noted that this commission, which was created upon the decision of a general assembly of the USSR Academy of Sciences, has been the most authoritative of all the numerous commissions which have studied the Leningrad Barrier. It includes 43 highly skilled specialists, including 5 academicians, and 8 corresponding members of the USSR Academy of Sciences, 2 members of the Academy of Medical Sciences, 19 doctors of sciences, and 8 candidates of sciences—ecologists, hydrobiologists, hydrologists, geographers, geneticists, hygienists, medical specialists, oceanologists, persons specializing in hydromechanics, hydraulics, and others. They represented the entire complex of problems connected with the Leningrad Barrier.

And, what was most important, upon the demands of Leningrad public opinion, this group of experts was, for the first time, truly independent of the system of sponsors and proteges, from the departments which designed and set up the plan, from the builders, who, naturally, have a vested interest in continuing their operations.

Evidently the independent stance taken by the commission members was so distasteful to those departments taking part in the construction of the barrier that they undertook a mass attack with demands that persons

unsuitable to them be withdrawn from the commission, including academicians and corresponding members of the USSR Academy of Sciences. Lengidroyekt—the principal designer of the barrier—demanded, for example, that almost one-third of the commission's members be dropped from it.

The commission worked in an atmosphere of high scientific principles. Any viewpoints were thoroughly listened to and discussed without any pressure whatsoever. Decisions were taken as a result of very careful analysis and discussions. It was precisely for this reason that the final conclusions were reached virtually unanimously. Of the 43 commission members, only 1 did not agree to sign the conclusion. In all groups of experts it is considered that such a result attests to the unanimous opinion of a commission, rather than the concept that it did not reach a unified conclusion, as the president of the USSR Academy of Sciences is attempting to show.

And so the commission came to the well-founded conclusion that the main reason for the sharply worsened ecological situation in the Leningrad region is the presence of the barrier, and that the plan itself was not well-founded, either economically or ecologically. Of course, such a conclusion could not suit the builders and designers.

In his letter to N. Ryzhkov, the president of the Council of Ministers, Academician G. Marchuk, the president of the USSR Academy of Sciences, states that the commission supposedly did not reach a unified conclusion concerning the role to be played by the barrier in ecological changes. On this basis also he requests that yet another international group of experts be called upon, and he proposes to invite the following to participate in it: the International Association of Hydraulic Research and the Delft Hydraulic Research Center.

Moreover, the letter mentioned not a word about the decree already adopted by the USSR Academy of Sciences Presidium, nor about the composition of the commission. An international commission is, of course, useful in certain cases, where a country does not have appropriate specialists or when it is difficult to find experts who are independent of monopolies. But in this case none of this was true: there were enough specialists, and their independence from departments or monopolists was ensured. Just what kind of "independent" commission is the president of the Academy of Sciences proposing to us? The International Association of Hydraulic Research includes among its leading officials none other than Candidate of Sciences B. Kartelev—director of the VNIIG [All-Union Scientific Research Institute for Hydraulic Engineering imeni Vedeneyev] and one of the developers of the barrier plan. The hydraulic model executed by this institute was subjected to harsh criticism in the conclusion of the commission, whose body included Academician L. Sedov, the leading authority and founder of the method of hydraulic modeling.

With lightning speed, already on 28 June, the USSR Council of Ministers had already entrusted the GKNT [State Committee for Science and Technology] with the task of preparing, with the participation of the USSR Academy of Sciences, the USSR Goskompriroda [State Committee for Environmental Protection], USSR Gosplan, the RSFSR Council of Ministers, and other interested organizations, specific measures for implementing the proposals contained in the letter from Academician G. Marchuk. The State Committee for Science and Technology is examining and considering this issue in the spirit of the "good old days" of stagnation: here it supports the proposal by G. Marchuk regarding the feasibility of conducting in 1990 an additional comprehensive study by experts of the plan for the Leningrad Barrier. Moreover, the GKNT proposes that this expert study be conducted "using the funds for the incomplete operations and for the composite estimated expenses for building the complex to protect Leningrad from floods," that is, for the estimated funds allocated for building the barrier.

And so everything is clear: the "independent," expert study will be conducted under the direction of the designers and using their money. The result of the "game" is predetermined: the administrative-command "team" will start and will "win." And not somewhere in the stagnant years of 1979-1980, but in our own times, in the sixth year of perestroika.

The stance (or, more precisely, the departure from a principled stance) taken by the president of the USSR Academy of Sciences on this issue is clearly in conflict with elementary logic. It truly is because, of course, it was specifically the academy leadership which appointed its own commission of experts, having assembled the flower of our science which it had at its disposal. By not trusting this commission's conclusions, Guriy Ivanovich Marchuk is proclaiming his distrust in this leadership and, therefore, primarily, in himself.

But there will be no contradiction of any kind if we assume that the governing factor here is not logic, not scientific proofs, but in the predetermined "stance" of the president himself: what does not suit him specifically here is the fact that the commission unambiguously declared itself to be against the barrier. Between two poles of a magnet, he himself experiences greater attraction specifically toward the administrative-command "pole." Guriy Ivanovich frequently refers to the fact that the Academy, as he says, executes the tasks assigned to it by the government, although it should be objective and impartial. But during the present-day period the president himself should sometimes take his own stance and not always "salute," or try to predict the desires of the "higher-ups." With all our respect for the government, it is bothersome as to why the president of the Academy of Sciences did not directly address the Leningrad Soviet. Was it not because he well knew the negative attitude of its chairman and the other new "city fathers" toward the barrier, this "child of the Romanov-type stagnation period?" Was it not because he assumed that he would

find a more complaisant or obliging attitude in the USSR Council of Ministers (and, indeed, that is the way it has turned out on the whole). Of course, during the present-day period the Leningrad Soviet, nevertheless, cannot be bypassed in such a truly All-Union, but vitally Leningrad, issue. And one can quite precisely forecast what the wishes of the Soviet authority of this city on the Neva will be when the question of the barrier's fate comes up for discussion at its autumn session. And that is why the advocates of the "great construction project" are in such a hurry to go over the head of the Leningrad Soviet.

For some reason, when it is a matter of our science's staff members blocking the path to spending money on anti-ecological plans, their actions in recent years have more and more objectively "played into the hands" of precisely the defenders of such plans, as if they were not confident that both sides were given a balanced hearing. That's the way it was in the case of the Volga-Chogray Canal, and that's the way it was with the Leningrad Barrier. The times are changing unrecognizably. But the actions of the president of the USSR Academy of Sciences have remained all-too recognizably unchanged. They are in very fine harmony with the unwritten imperative of the administrative-command system and serve departmental, i.e., bureaucratic interests rather than scientific truth.

Commission Declares Ecological Disaster in Danube-Dnestr Region

90WN0157B Moscow SELSKAYA ZHIZN in Russian
5 Jun 90 p 2

[Article by TASS Correspondent G. Vorotnyuk, Odessa: "They Have Created a Disaster Zone"]

[Text] Instead of a zone of abundance, as was promised by the reclamation workers, the region of the Danube-Dnestr Irrigation System has been recognized as an ecological disaster by the interdepartmental commission and which upon the demand of the public had been sent out by the USSR Council of Ministers. And this was after both here and in the south of Odessa Oblast, over 200 million rubles had already been invested in creating the system.

The "delayed action mine" under the nature here and under the socioeconomic development of the region was laid even when two decades ago the institute Yuzhgiprovdokhoz [Southern State Design and Scientific Research Institute for Water Management Construction] (Odessa) and the Ukrainian Minvodkhoz [Ministry of Land Reclamation and Water Management] worked out the technical plans and began building a major water management facility. The basic project in its first stage was the enormous (with a volume of 800 million m³ of water) Lake Sasyk by the Black Sea, having decided to convert it from salt water into fresh. This lake precisely was given the role of the first storage facility for the Danube water and from whence it was to be moved to the Dnestr, the

Southern Bug and then to the Dnepr, turning the adjacent arid steppes into flourishing oases.

They did as they planned. At a shock pace they dug a canal from the Danube to the Sasyk and they filled in a 14-km barrier between the lake and the Black Sea, they began pumping out the salt water, replacing it with fresh. The plan was that after two or three changes the water would be fit for irrigating. But even after eight changes the water was unfit for irrigation. All the same, they began delivering it to the fields. Intense degradation of the invaluable southern chernozems and their salinization had begun. Here the harvests were often worse than on dry-farmed land and in addition the cost of agricultural products jumped sharply.

"But what about the lake itself?"

"It, without exaggeration, is dying before our very eyes," feels the Deputy Chairman of the Permanent Commission of the Oblast Soviet for Ecology and Rational Nature Management, Candidate of Biological Sciences I. Rusev, "Its medicinal muds, in essence, have been destroyed. The water which is oversaturated with blue-green algae blooms and rots. Fish kills have become more often. The appearance of bacterial flora has been observed. As a biologist, I assert that the only way for saving the lake is to reconnect it with the sea. And this must be done as quickly as possible."

This is the opinion of not just I. Rusev, but also many other practical scientists. The inhabitants of a number of villages lying around Sasyk, in demanding the immediate adoption of conservation measures, have stated that if their voice is not heeded, then they themselves will remove the barrier between the sea and the lake.

But what about those who are to blame for the ecological disaster? Seemingly, they are more concerned now not by the fate of the doomed lake or the people living around it, but rather the honor of their own reputation. Having abandoned Sasyk to its fate, they are hurriedly seeking out ways for delivering Danube water to the fields, in bypassing the nonworking storage capacity. Their reasoning is: let us do this and increase the crop on the irrigated lands and everything will be forgotten and everything back in place! But in their hurry there have again been poorly conceived actions not backed up by ecological expertise and soundness. For example, the digging of a canal along the eastern bank of Sasyk, across the seacoast which possesses priceless recreational opportunities and where a governmental decision prohibits any industrial construction.

Sevastopol, Odessa Take Environmental Action

LD2608130990 Kiev International Service in English
2300 GMT 25 Aug 90

[Text] The soviet of the city of Sevastopol in the Crimea took radical steps to improve the ecological situation in that city. A waste processing plant is converted into gas furnaces instead of oil, and powerful dust filters will be

installed in the quarries not far from the city. Alongside this the industries polluting the air will now face impressive fines and penalties.

The stance of the Sevastopol authorities was welcomed by the public, whereas in Odessa things ended up in a dispute. The showdown is between the city soviet and the local port plant producing ammonium. The city soviet decided to close down the dangerous production, whereas the workers of the plant came out in defense of their interests. Only the Ukrainian parliament will now clarify the dispute. However, both sides appealed earlier to the Supreme Soviet awaiting its solution.

Rostov Oblast Ecological Problems, Antinuclear Efforts Chronicled

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Apr 90 pp 40-45

[Article by Ivan Kunitsyn and Aleksey Nikolayev, "Along the Don is Walking...the 'Peaceful' Atom"]

[Text] The all-union independent comprehensive ecological expedition of YUNOST visited Rostov Oblast this time. Those who participated or provided material assistance were: Anton Gerashchenko, writer; Eduard Mustafinov, director of the Rostov Nuclear Electric Power Station under construction; Vsevolod Maryan, editor of the science section of the journal YUNOST, director of the expedition; Nina Sushkova, inspector of the Tsimlyansk Fish Hatchery; S.A. Lopukhin, P.G. Strukov and other residents of Tsimlyansk. Also activists and members of the movement "Green Wave" of the cities of Volgodonsk and Tsimlyansk.

"And we don't put bast sandals on our hands." Russian proverb.

"We, the residents of the city of Tsimlyansk of Rostov Oblast, ask the journal YUNOST to be our lawyer. The heart of the matter is that..." This letter stood out from the abundant reader's mail, appealing to us by its concern and pain to be defenders not of one person, not of ten, but of millions, and the River Don with them. "Who will hear our SOS signal? Who will save us from the specter of Chernobyl? From the grasping, suffocating tentacles pulling from the time of stagnation?"

While our social, economic and medical sciences have not reached a unanimous opinion on which indices should be decisive in defining the quality of people's life, we decided to begin our own analysis in Rostov Oblast from a concrete index not subject to conflicting interpretations: the mortality rate. And, honestly speaking, the data presented by the USSR State Committee for Statistics shook our idea of the Cossack Don as a stronghold of physical and moral health. It turned out that of the thirty largest cities of the country Rostov is among the three "leaders" in the number of deaths. The so-called natural growth per 100 persons (the difference between the number of deaths and births) is only 2 persons. It is worse only in Moscow and Leningrad. In the death rate

of children who die before the age of one, Rostov is right behind the cities of Central Asia and the Caucasus, occupying eighth place on this sad list.

The YUNOST expedition had to alter its plans set long in advance and, changing its itinerary, set out immediately for Rostov. It could not even be stopped by a genuine disaster unexpectedly falling on the heads of the journal's special correspondents: we lacked the already meager editorial equipment we had: dictophone, cassettes. We were simply robbed. The first day of our arrival...

The city presents us its ecological business card right at the train station square. The Temernik River, which intersects Rostov, is one more stinking and lifeless monument to the criminal senselessness and suicidal patience of our time, which will go down in the nation's history (together with other gloomy epithets) as the epoch of ecological genocide. The number of dead rivers, lakes, forests and natural monuments is already up into the tens of thousands. We repeatedly are convinced that the Red Books of the USSR and the union republics, published with such difficulties, are only a small chapter of the yet unwritten huge Black Book of crimes against the nation's nature and human health. Yet today as well the crowds of arriving and departing passengers each day cross the bridge over the Temernik at the station without glancing at the river. Though some people do not ignore it, judging from the impressive amount of bottles and packages thrown into the river over the years from roadside stands. But for most Rostov residents it's as if this river did not exist until recently. Oh, they heard that each day the city's enterprises dumped 200,000 tons of all sorts of dirt and refuse into the Temernik, which means into the Don as well; oh, they knew that it's not safe to be on its shores (no one has thought of swimming in it for years now); oh, they smelled its stench...but it's as though it wasn't there at all. Which is understandable: it's a monument when there is one, but when there are thousands of them, all alike, it's a gray, undistinguished background. It contains many dangers. And it is frightening not only that people learn not to see beyond its haze the variety, brightness and uniqueness of a sensible existence, but also that sometimes they fail to notice against this background the mortal danger approaching.

Evidently the "city fathers" considered this in making the decision to build right in the central part of Rostov on the Temernik River a refuse incineration plant. Such an ecological and public health surprise for their fellow citizens. And what of it? Rostov citizens drink water taken from sites where the maximum allowable concentrations of harmful substances have been exceeded many times, and nothing happens; they keep quiet. If a chemical plant stands in the center of town, the nearby residents wash off their windows in the morning a layer of who knows what, they tolerate it. Up to thirty thousand automobiles a day drive along some of the city's streets (according to research done not by us, but unfortunately by the Germans, the poisons emitted by only six thousand vehicles travelling along one road per day

increases the chances of its residents contracting cancer by nine times); already 130,000 cancer patients have been recorded in the oblast; the number of cancer cases is growing rapidly, but if you do anything, they are silent. So that "everything is in order" with our background. We are building the refuse incineration plant right in the center "for the public good": it's cheaper to bring it in than to carry it out. So what if 200,000 persons live in the Temernik hollow and poisonous smoke travels along this natural pipeline through their houses? People breathe the emissions of a plastic products plant and the plastics shop of a watch factory; though invisible, they are highly toxic, creating a carcinogenic cocktail from the burning of over 200 types of plastics found in the refuse. True, it is still unknown what kinds of poisonous substances form when they are mixed, but let science figure that out, it will study and report. But for now... If people cannot live without creating refuse, then they will have to be patient, we'll burn it under their nose.

Yes, the Soviet man is patient. Are such records noted in the Guinness Book of Records? It's true that our lives are meager and short, but we'll lay odds on long suffering against anyone else. What are they against us without our social and ecological background?

So the people of Rostov were patient, until the first whiffs of perestroika and glasnost reached them. They woke up when eight of the twelve million planned for building refuse incineration plants had already been spent. And not someone else's money, but their own, which made it worse.

But...people want to live. And Rostov started grumbling. They collected 25,000 signatures against the plant, they banded together, exerted pressure, and won the first victory, very important for public self-awareness. Our people are gradually learning the methods for combating their own "servants," but there are still few of us who recognize the need to start with ourselves, with our own work collective, with our own responsibility for the impending catastrophe. After all, of the 25,000 who signed the appeal most are workers, closely connected with other enterprises polluting the city. It's easy to find justification: "The system is guilty of everything." But all of us are not screws, but the flesh of this system. If entire work collectives, regions and zones begin to fall off of it, will it survive long?

We also are thinking about another detail in the Rostov "garbage saga." We have long consoled ourselves with the wisdom that "ben around, we'll patch up a couple holes, pull our belt tighter and show them a thing or two. So here we are showing them, and they're not laughing, and we are sad, and how expensively. And what have we come to? It's not advantageous for us to take the best "from there," but it turns out that it's very profitable for them to take "from here" not a heifer, but...our garbage. There is a plan by which the Spanish have agreed to build a refuse processing (not simply burning) plant near Rostov for free. And what do they get in return? Trifles: all the scrap metal and valuable materials which we, with

unique beggarly luxury, throw onto the scrap heap; they will take to and, it turns out, very attractive to them. Evidently, for the directing municipal managers this idea was the apex of national business: we give them some kind of miasma; and they give us—ha ha, a new little plant (or plants?). We really put one over on them, huh? And we don't need to rack our brains. But we cannot view these projects as something other than another national disgrace (experienced, by the way, by even the poorest developing countries, to whose level such decisions will probably bring us), as a new insult to our dignity. First oil, coal, lumber, technology, the leaders of the nation's cultural renaissance, and now garbage. What else should we scrape the bins for, in order to gain the dubious right to call ourselves a civilized country, a superpower?

The Don still retains the title of "the purest of the major rivers of the European part of the USSR." True, this refers to the middle and especially the upper course. This is a strange formulation. Sort of like "a poultice for the deceased." The purest must be chosen from the pure. But there are none of them left. But the dirtiest of the dirty. Here one can agree: the Don is not yet the worst, there is still something swimming and reproducing in it. But not thanks to the efforts of people; just the contrary. This is nothing to be proud of.

Here's what the elderly Cossack Ivan Nesterov told us, a former head of a former fishing crew of the Staryy Don village (neither the crew, nor the village, of which there were many thousands in the past, have existed for a long time)—they were not for the long term. He spoke with the hidden sorrow of a morally healthy person not yet become wild from "civilization."

"Many years ago something unknown came out at the Voronezh Nuclear Plant, somewhere up-above Veshenskaya. They scratched under their hats and let out some kind of unneeded water into the Don. It was winter. We put our nets under the ice in winter as well. We take them out one day and we don't believe our eyes: nothing but sterlets and other sturgeons. Honest mother, what is it that pushed up to the ice? We started to cut airholes, and it's pushing and pushing, trying to get up onto the ice. It was frightening, of course; we forgot about everything. But we didn't want to lose it: you could see that it felt sick in the water, it was begging to come to us. We pull, and pull...we hauled up seven annual plans of this fish. I was already ready to get a medal. In the spring the ice broke, and in the inlets and channels there's all kinds of fish! White. Dead. The floodwaters took them away, and since then we've had no sturgeon. Then they thought quickly, and released some kind of fish with a funny name, bester or something (a hybrid of beluga and sterlet). But the way it grows, they're all little."

In the city public ecological center we were told that the so-called discharge of water near Rostov is 5 to 6 times less than the total quantity of unpurified waste in the basin of the Don and Northern Donets Rivers. In other words, when it gets to Rostov the water has already been

processed 5 to 6 times in various enterprises. Knowing this irresponsibility towards nature and man, and the quality and low capacity of purification facilities, one can imagine what the "purest river" is carrying. It's been forbidden for years in the oblast to drink unprocessed water from the Don. People do not drink, but...continue to poison with their own hands the former provider-fountain "grandfather quiet Don," or rather, what's left of it.

But if water pollution is only visible from the shore, Rostov Oblast residents can see the pollution of the air basin from space if they want. Not from an orbital station, of course, but from photographs taken from there. On them one can see something completely unbelievable: a black cloud stretching from Novocherkassk all the way to Kiev. This eclipse is a defect not of the film, but rather of our public awareness. That's how the train of smoke stretching hundreds of kilometers from the Novocherkassk State Regional Electric Power Station looks from orbit. But people live and die under it! This one polluter alone each year dumps on each resident of the oblast 100 kilograms of substances which hardly improve their health. Every industrial enterprise in the oblast contributes to its own suffocation, and there are around 500 of them.

We should also recall that the Rostov Oblast has coal. If any of our readers have not been in the mines, we envy them. They're horrible! Flaming and self-igniting gigantic waste piles, black dust, getting into everything living and not living, some sort of landscape after a battle of light and dark forces, where the dark forces have won. Once you've seen it you can never forget it no matter how much you want. And to live here all your life?! And hundreds of thousands of our fellow citizens have been living here. They've gotten used to it; for example, in Novoshakhtinsk (and in other mining towns, of course) they don't buy their wives and daughters white furs: they're expensive and pointless, since after all they get grey and black right away. But the thirst for life and dignity has not been completely eradicated in our people. Last summer the miners stood up to their full height, grabbed with their permanently blackened hands their "servants" who have lost their vigilance and sense of reality, shook them until they lost their breath, but... It's not by chance that economics and ecology share the same root. The former used to beat the breath out of the latter. Now ecology could turn out to be the epitaph of our cannibalistic economy. So that this not happen, the miners themselves (and not only them, of course) must tear the coal veins out of themselves, shovelling what was piled up during the days of "developed socialism," which inevitably means losing something in economically providing a standard of living.

But let us dwell a bit longer on the space pictures. In the north of the Rostov Oblast the Don suddenly changes from a thin blue thread into a long blot with ragged edges. This is the Tsimlyansk Water Reservoir, the country's largest artificial fishery reservoir, 250 kilometers long. At its southernmost point, where the Don turns

back into a river, are two cities, Volgodonsk and Tsimlyansk, with a population of 250,000. Further down the river live two million more. From the ecological standpoint this is a very vulnerable place: water intakes for people and irrigation, fisheries, recreation and health treatment areas. And most importantly, of course, the condition of the Tsimlyansk Reservoir largely determines the ecological equilibrium of the entire lower Don region. All it takes is to place a dangerous industrial facility on it, and the equilibrium (already very unstable) is disturbed, and will become a catastrophe in case of an accident.

And such a monster has been built. Not just on the shore, but on the reservoir's surface, separated from it by only a dam.

The Rostov Nuclear Power Plant. It is the last drop overfilling the cup of people's patience. "Emotions, not facts," the bureaucracy and technocracy said as one to the "timid" oblast population. "Democracy is fine, but specialists must make the decisions..." But without a healthy legal mechanism for making the social and economic decisions of greater importance to the people, without true people's power in the local Soviets, without widespread public awareness the ecological situation cannot be resolved. As before, in each conflict with the concerned public of a given region the technobureaucratic alliance will play a dubious trump card every time: "By your stubbornness you're only pursuing your local, egotistic interests, you're blocking the growth of the country's economic level, you're putting the weight of the struggle for a bright future onto the shoulders of other regions." But let's look at the result to which blindly following this bureaucratic logic for years has led. The country has not a single populated area which could even conditionally be called ecologically well-off. So how can you talk about shifting something to someone else's shoulders? Literally everyone is tied together by the system of mutual poisoning. And an army of "qualified specialists" has formed in this struggle against their own people. Let's look at the results of their uncontrolled and irresponsible activity in Volgodonsk, under whose walls is being built the Rostov Nuclear Power Plant (why is it called the Rostov Plant, by the way, if it's 300 kilometers from here to Rostov?).

The small Don city of 30,000, with a settled way of life and strong local, Cossack traditions, no better or worse than other such quiet provincial Russian settlements, was awakened by one of those noisy, pompous and senseless "constructions of the century," with which our government in the time of stagnation used to cheer itself like a very sick economic and ideological drug addict. As the correspondent of a very industrial newspaper put it, "only a lazy journalist did not earn his pants" in praising the Atommash, just like the Balakovo Plant and other nuclear power plants. Some publications even introduced permanent rubrics, to convince the Soviet people with their publications that they will go straight into the age of prosperity with such and such a giant plant for producing equipment for the "peaceful" atom. Let's sum

up the results of this propaganda twaddle. The plant was built on sagging soil. Huge sums are being spent combating its "self-destruction." At a design capacity of eight VVER-1000 reactors per year there have not yet been eight produced in the entire history of "Atommash." It turns out that the country just doesn't need that many. The enterprise is running at less than 45 percent capacity. The technological processes turned out to be scientifically unsubstantiated. For lack of a sensible nuclear strategy the plant, like an exhibit of expensive imported equipment, is at a crossroads. And with it Volgodonsk, in which 230,000 persons from all over the country are living. An immigrant people usually is without roots (we now no longer have illusions about the true builders of "shock Komsomol" construction projects); the social balance has been disturbed, age-old Cossack traditions have been swept away, the full spectrum of ethical and moral problems has appeared. The city has some 30,000 single mothers, in only six months of last year teenage crime was up 300 percent, racketeering is flourishing, there are frequent fights among gangs of youths, and nationalist clashes have become more frequent. The bureaucratic tactic is well-known: in putting on the back of some city the next giant enterprise, public opinion is "sweetened" by promises to improve the city infrastructure, provide heat, sewage treatment, roads, and so forth; in other words, to solve the age-old problems of any of our cities, which the poor and suppressed local Soviets could never overcome with their own resources, and cannot today. We know how much these promises are kept, after the bureaucracy has met its goal. New problems are added to the old. In the end, the present Volgodonsk's needs are not met: for housing, by 21 percent; children's facilities, by 26; schools, by 37; hospitals, 56 (!); and cultural facilities, movie theaters, restaurants and cafes by 86 (!) percent. A third of the city's children cannot study normally; over half the population lacks prompt and effective medical services; practically the entire city population lacks civilized leisure! Add to this the story of the collapsed nine-story apartment building, after which 300 new apartment buildings, designed by "specialists" on the sagging Volgodonsk soils, were put under permanent monitoring. Is it any surprise that people have no faith left in the "competent organizations," which have presented them such a miserable and dangerous existence?

And against this background have already been invested one billion, 200 million rubles in the construction of the Rostov Nuclear Power Plant, whose dark profile on the horizon reminds people that all their present suffering is still a trifle compared with those possibly lying ahead. And for that kind of money Volgodonsk, and neighboring Tsimlyansk, and half the oblast's populated centers could have finally been made into a residence worthy of being called civilized.

But "specialists" consider our fruitless cries and confusion to be nothing more than childish naivete and economic idiocy. "And where will you get the energy which is already in short supply everywhere, and the

heat, the light? How will you ensure the planned growth of the oblast's economic potential? You bring on yourself regional full cost accounting, but didn't think about the fact that you get up to 20 percent of your electric power from the Ukraine; have you decided how you're going to warm yourself in the winter? So you still haven't heard that we have no alternative to nuclear energy?"

These are the basic arguments of the "atom supporters," and of central and local authorities with them. Why can the oblast's population not be calmed down, why will they not accept official reason—100,000 signatures have been collected in Rostov, Volgodonsk, Tsimlyansk, Novocherkassk and other cities on a demand for an independent social-ecological study of the Rostov Nuclear Plant, and a regional referendum on this problem?

The bureaucracy not only remains silent and stalls, hoping to carry out its projects before people mobilize; it also attacks, waving obedient administrative authority like a club, beating people's hands and discrediting activists. But this only makes the appeals for help louder. To whom are they directed? To the lord from Moscow who judges all? To the deputies from public organizations, who applauded, stamped their feet and cheered for the "Moscow fraction"? To the local authorities, using the police in their dialogue with the public on environmental protection questions? Of course not. The residents of Rostov, in inviting the journal YUNOST to be their advocate, are appealing to the nation's public opinion.

So let's look at this imaginary trial in which the oblast society is accused of incompetence on at least four points. As the prosecutor we appoint (true, without asking his permission, for which we hope we will not be harshly judged) the director of the Rostov Nuclear Plant being built, Eduard Mustafinov, the recognized leader of the oblast's "atomic" forces. And an eminent and distinguished person for them. He was the head construction engineer for the Armenian Nuclear Power Plant. Its reactors started up under him. So Eduard Nikolaevich lived through the terrible catastrophe of Armenia as his own, though at a distance. And what if it collapses? No, it held up, which means it was well built. True, its region was shaken less than those which suffered most, but they decided even so to remake it into a thermal power plant. He has participated in designing many nuclear power plants which are still in operation today. He appeared in the Rostov Oblast in 1977 as the head engineer of the Rostov Nuclear Plant project. He himself chose the construction site. Of many versions he chose the most economical, the shore of the Tsimlyansk Sea, in order not to spend money on digging canals and a man-made cooling pond, or building cooling towers. In doing so, the reservoir lost the main spawning grounds of the valuable Don fish. But who then thought about fish? It was still nine years to Chernobyl, so it seemed almost a blessing to put the power plant between two cities (13 kilometers from Volgodonsk and 10 from Tsimlyansk). And the decision was made by numerous official commissions

and agencies. So we won't particularly criticize comrade Mustafinov that he bears responsibility for "mining" the Don, for the fact that the basin of the great river and the millions of people living here have become hostages to nuclear power. The nuclear authorities were so sure that they were infallible and accident-free that they named him director of the nuclear power plant being built. Very convenient: you design it, you build it. Except that mutual monitoring of the designers and builders is somehow overlooked. Who should director Mustafinov ask about design faults? It turns out, himself. And who should former head engineer Mustafinov ask about violations of the design indices during construction? Himself again. So Eduard Nikolaevich is in a surprising position: all of us, both competent defenders of nuclear power and its incompetent opponents, set great hopes on you. In case of a cataclysm the first person to ask will be you (but who will be left to ask?). So don't slip up on reliability and safety. That is, if the plant despite everything goes into operation. But even so, maybe beforehand the question could be resolved in a friendly manner and the regional referendum demanded by the public conducted? To our question, E. Mustafinov, an energetic person, hard-working, evoking genuine sympathy by his conviction, a big man in size and in technical thinking, still young, answered with questions.

[Mustafinov] "Show me where it's written in the Constitution that a referendum is a legislative decision? So does that mean that if the people vote against, construction is stopped? A referendum is only an opinion, which the government can listen to or not listen to. It's all playing at democracy, you understand." "No, we do not understand, though we realize that for the people's opinion to be decisive more than one more battle must be fought with the command-administrative system. One such "battle" took place in Rostov during a meeting in Theater Square on September 3 last year. Or more precisely, a beating. In breaking up the gathering of opponents of the Rostov Power Plant construction, organized by the Don People's Front, militia and special division forces were used against the three thousand participants in order to repress people singled out in advance. Six of them were later tried and fined by a one-man court for the same old reasons and without hearing defense witnesses. That was the "dialogue" of the authorities with the public.

From the statement of Rostov Public Ecological Center Deputy Chairman F. Yalaletdinov to Oblast Internal Affairs Administration Acting Chief Militia Colonel M. Fetisov: "I firmly request that during our ecological meetings you not unleash young men with wild eyes against the people. How they hate us! Only because we want to leave our children a living Earth! People dispersed quietly and peacefully. Why this brutality?"

We provide this information for those functionaries who, hiding behind the unconstitutional decree on meetings, really think that the public has been seized with some kind of unknown, senseless aggressivity and passion for shaking "the foundations." This decree again

and again places the people in the position of the defendant. A simple political trick. But we have no doubt that its outcome will be tragic (and for the nomenklatura as well). So the first count of the "indictment" against the public: people do not comprehend the state's energy policy, they do not understand that we stand on the threshold of an "energy famine."

[Mustafinov] "Our country has set for itself the task of living twice as well by the year 2000. In other words, by that time we must build an economy equal to two of the present-day Soviet Unions. This means that we must consume energy at least at the level of the top ten developed countries. Today we are twentieth in terms of energy consumption per capita. Each Swede, for example, receives five times more electric power than a Soviet person. Moreover, the Western countries have reached a stable level of industrial production. They don't need to develop it further in order to live better. They live well already. That is why their electric power production is stable. We must double our power output to meet our plans. Even if we achieve a 50 percent increase through conservation, we must still somehow find the same amount again. One often hears that the alternative to increasing the power potential is energy conservation. But let's be realistic. Today, we cannot conserve more than 35 percent. To save more, industry must be switched to new technology. But this requires huge expenditures, new capacity and materials, more electric power, and mostly time, at least 10-15 years." It's much simpler not to invent anything new, but to direct money where it's planned, to what is already conceived and set: to raising the proportion of nuclear power plants in the country's total energy balance. The realism of yesterday, proclaiming the patching of holes to be the acme of perfection.

Let's listen to other opinions about the realism of development of our power industry. They were expressed at a "round table" on problems of the Rostov Power Plant, held in Volgograd by the senior scientific associate of the Institute of Biology and Geophysics of the USSR Academy of Sciences Siberian Division V. Shepelev, laboratory director of the Institute of Mathematics of the Siberian Division B. Gavrilko, and candidate of technical sciences from Rostov I. Kovalev.

The arguments of the "antinuclear opposition" are convincing, that the third energy program adopted in October 1988 was just as far from realism and from the economy's needs as was the preceding one. By the year 2000, the administrative power clan proposes to put on line 200 million kilowatts of new power capacity (60 at nuclear electric power stations, 70 at thermal electric power stations, and 70 at hydroelectric power stations). This means that each year we must put into operation 20 million kilowatts' worth of new stations, plus modernizing 10 million. The utopian nature of such decisions is indicated by the fact that in the last 30 years the country has not managed to bring on line more than 10 million kilowatts of new power capacity a year. The costs planned for realizing this program are comparable with

the material losses of the USSR from the destruction in the Patriotic War (700 billion rubles). Such complacency on the part of power "gigantomaniac specialists" will lock up the capital investments of several economic sectors and deprive our economy of the freedom of maneuver so necessary for perestroika.

And now let's compare what is proposed to be spent with what is planned to be done. The gross national product of Japan, for example, is today estimated at around 3.7 trillion dollars. Ours (according to various estimates) is from 0.7 to 1.3 trillion dollars. Producing three times more than us, Japan uses three times less electric power. We are almost four times behind the USA in this index. It is suggested to us that we "build two Soviet Unions," that we double electric power output, without changing anything in the principles of extensive development. This means that without even reaching Japan's current level by 2000 we will have to use six times more electric power than it does today.

"There is no alternative to nuclear power..." People say this who know perfectly well that the export of our fuel abroad now amounts to 418 million tons of fuel equivalent, and it is growing at a frightening speed. The amount we sell would suffice to not build 100 new nuclear power plants. If we consider that 42 reactors are presently in operation in the country, and that this is about 9-10 Chernobyl-type nuclear power plants, then cutting our fuel exports by only 10 percent would save us from our own still-dangerous nuclear power and the growing public indignation resulting from the "specialists'" lack of desire to consider public opinion.

"The country needs hard currency..." is the main argument of competent high officials sanctioning a squandering of national natural resources unprecedented in the history of our country (and perhaps in that of the civilized world). As a result, we have a chronic shortage of hard currency, and supplies of natural resources are being exhausted catastrophically. We are offered nuclear power as something supposedly independent of natural resources which will not last for long.

When we talk about conservation, this of course is not a call to exist on the brink of freezing and in darkness. It is a worthwhile means of existence for a people which respects itself, values its resources and firmly controls its own future. It has been calculated that replacing only half of our incandescent bulbs with second generation fluorescent lights, as was done long ago in the West (they are four times more efficient), would yield a savings equal to half the power output of all our nuclear power plants. When the USA decided to drastically conserve power in 1973-1978, computers were used to determine two basic directions of conservation: reductions in automobile weight, and the heating of houses and public buildings. This allows a power savings of 95 Chernobyl-type nuclear power plants or replacement of ten times our present nuclear power. The USSR is "unique" in many respects. In particular, only we use central heat supply. Our country prepares for each winter as for a

fight for survival. Vast labor, material and financial resources are spent to maintain this Cyclopean system in an accident-free state. Yet even so an integral part of our life is permanently dug-up streets and interruptions of heat and hot water (or complete outages). But the efficiency of fuel use in centralized heating is only 9 (!) percent. The whole world uses local hot water boilers. The Americans put them right inside buildings: full automation, gas, minimal servicing, and efficiency of 100 percent. Using hot water boilers in place of central heating would save us 33 nuclear power plants, equal to replacing three times our present nuclear power.

The domestic power complex absorbs (while literally throwing the greater part to the wind) 58 percent of everything produced for the country's industry. Think about this number; it is a huge piece of the hardly filling national pie.

But let's return from the theoretical sphere to the shore of the Tsimlyansk Water Reservoir. In the near future, we will have dozens of new nuclear power plants imposed on us; let's see what methods are used to build just one of them, and how it affects public opinion.

Remember: the Rostov Nuclear Plant was designed in 1977, long before Chernobyl, during the years of stagnant complacency, when the pillars of nuclear energy maintained: "A reactor is just a boiler, and the operator a simple stoker." After the 1986 tragedy, new "Regulations on Siting Nuclear Power Plants" were created.

Rejoinder from the "court house":

[P.G. Strukov, resident of Tsimlyansk, retiree]: "Comrades, what I believe to be the most important of the "Regulations" has been violated. According to them, a nuclear plant of over one million kilowatt capacity may not be built closer than 25 kilometers to a city with a population of over 100,000 persons. Volgodonsk has over a quarter-million residents, but the Rostov Power Plant is 10 kilometers from its edge, and its rated capacity is six million kilowatts. What do we have to do for them to remove it, go on a hunger strike, or rally around a bonfire?"

Another point of the "indictment" against the public: construction of the cooling pond directly on the reservoir's water area will cause no problems.

[Mustafinov] "I see no danger in the fact that the cooling pond is separated from the Tsimlyansk Reservoir by only a dam.

"But according to the new "Regulations": "If a nuclear plant is situated along the shoreline of public use water resources, the distance from the shoreline of these resources to the nuclear plant must be at least one kilometer." The Rostov Nuclear Plant stands right on the shore, and its cooling pond is part of the reservoir!

["Defense witness" N. Sushkova, inspector of the Tsimlyansk Fish Hatchery] "The cooling pond took away from the reservoir two thousand hectares of shallow

waters where the main spawning and feeding areas of the Tsimlyansk fish are located. The harvest of this unique fish has dropped by half. But the situation will be even more frightening if the nuclear plant goes on line. The Tsimla is already contaminated by blue-green algae. The plant is not yet in operation, but the cooling pond is supersaturated with this disaster: a closed area, shallow water, the water heats up easily, so the algae grow without limit.

"The third point of the "indictment": people do not understand that the quality of construction of nuclear power plants has never been so carefully and efficiently monitored.

A question to E. Mustafinov: "Can you guarantee that the quality of construction will ensure the ecological safety of the plant's operation?"

[Mustafinov] "I can. We have very high requirements on the design and execution of the work. For the first time in our country, the assembly of the reactor vessel has been performed at "Atommas" under our supervision. We're confident about the reactor today."

It turns out that previously reactor purchasers were unable to supervise the reactors built for them. Take what you get. And the Rostov Nuclear Plant apparently is in luck, if only because "Atommas" is nearby. And what does it mean that "We're confident about the reactor today"? Does that mean that we should not as before feel confidence in the 42 reactors in operation in the country's power plants?...

We admit that in our imagination the construction of a reactor block has been wrapped in elements of science fiction: sophisticated unknown mechanisms, filigree precision, automation, the sharp eyes and concentrated faces of superspecialists performing a technological ritual. But upon approaching the Rostov power plant block being prepared for startup, stepping over the first puddles filled with construction trash, and walking around the piles of scrap metal already sinking in the mud, we felt ourselves to be on one of our "own" Soviet construction sites, disordered and spreading off in various directions. A careful attitude towards his job was visible only in the guard, who studied for a long time the paper allowing us to enter the hermetic shell of the reactor hall. Walls covered with writing, water dripping from the ceiling, the usual warnings of our guide: "Watch your legs"; "Watch your head". But perhaps the strongest emotion awaited us when we went up to the block's dome. The stinking darkness of the stairs, the caution as on a minefield. The appearance, or rather the stench, of the extent to which the workers secretly foul their own work, erased, honestly speaking, at a purely emotional level, all the plant management's assertions about the high quality of work performance.

And here is evidence free of unnecessary emotions. "So what, an ordinary construction site," says A. Novogrenko, rock climber and assembler, who has worked over a year on construction of the first block of

the Rostov Power Plant. We will give only a few of his many examples of poor work organization, design violations and downright poor work.

"Several different 'companies' worked on the assembly. We got in each other's way, one firm's alterations forced others to make alterations as well. And the people are different: one, gritting his teeth, keeps on trying to do better, while another, whistling, puts on a decorative weld and that's it. The welds are polished and painted with five layers of special enamel, just try to tell them apart... Our managers forced us to violate the correct assembly sequence. Because of additional cutting and welding with a lap this increased the metal content and weight of the structure and caused a change in the structural parameters: rigidity, strength, and ultimately reliability. The distribution of the load in the structures is different from the design and...unpredictable. Worst of all are the frequent—several times a day—interruptions in the electric power supply. When welding third class reinforcing rods by the bath method a loss of power causes a flaw, although it's very hard to detect. Or a crane is used to place an ice-covered structure onto hot joints: the ice hisses, steam billows up, and the joint gets red hot. And the builders poured the concrete in layers, which means sometimes a layer of ice and a layer of concrete... The high transport aisle covered with a thick hermetic plate is designed to carry the reactor on a special carriage, turn it and lift it to the dome where it's installed. During assembly, the distance was not maintained between the floor and the ceiling, enough so that the reactor could not be turned and placed into the shaft. After discussing all the possibilities for remedying it, they decided to do it the simple way: powerful hydraulic jacks were brought in, pillars of pipes were made, and the ceiling was pushed up as far as needed... We had one Vitya, small and thin, an invaluable worker: only he could climb up onto certain series of wall panels, and that only by stripping to his shirt. Imagine: metal and concrete around, 20 below zero with a wind, and someone has to climb into this hole, tighten bolts, take joint scarfs and put them into place, cut, grab and weld a blind just centimeters from his knee, waist or shoulder. A trained body does not flinch when slag burns through clothing, only the skin around the burn trembles, and the lips grimace...

"Can we really trust the quality of such assembly? A. Novogrenko is sure we cannot.

And the final "indictment" of society, in our view the main one: specialists, not dilettantes, must decide the fate of scientific and technical decisions.

[Mustafinov] "The journal YUNOST, like NOVIY MIR, is no longer popular here. Because in your pages lawyers and writers have suddenly become nuclear specialists. It's gotten to the point where your author B. Kurkin understands physics better than International Atomic Energy Agency Chairman Blix and any academician. Now they've latched on to G. Medvedev, but he's incompetent (G. Medvedev worked for 40 years in the

Ministry of Atomic Energy system; allow us to ask, who should then be considered competent?—editors). I'm not against letting anyone speak his mind, these days anyone can say what he wants, without, by the way, answering for anything. We don't know how to call someone to account and bear the responsibility... But, understand, the job has to get done! And the priority in technical fields should lay with the specialists. You can't heat and feed the country with emotions.

"The management and builders of the Rostov Nuclear Power Plant, besides dark pictures of economic collapse if nuclear power is eliminated, also use this argument: "Our country has experience in the refusal of leading technologies, of the achievements of science, which were declared to be the work of wreckers and their creators 'enemies of the people.' We are firmly convinced that certain people benefit from the noisy campaign and the 'public activity' directed against the Rostov power plant. This group is artificially whipping up fears about the plant, and on this wave is trying to create popularity for itself and to gain political capital...

"As we can see, society is thus scolded: genetics and cybernetics were destroyed in their day, isn't it time to calm down? And they point to the true "enemies," the "political capitalists." And what kind of times are we in now? Isn't it naive to still turn everything upside down like this and cry "Sic him!"? The destruction of advanced science, organized by the Party-state apparatus and conducted by selected "specialists" from science, is now "hung" on the people. They, dark and insatiable, today thirst for the blood of nuclear specialists! An effective idea of the technocracy. But the situation is such that the country's present leaders unfortunately continue to unconditionally believe in the panacea of nuclear power with first-generation reactors. And they don't allow it to be criticized. The people of Rostov were forbidden to hold a Chernobyl Memorial Day. And militia truncheons protected the interests of nuclear power.

Reponse from the "courtroom":

[A. Shestakov, docent of the Novocherkassk Polytechnical Institute] "It's time for management to understand that the problem of nuclear power has not only a scientific and technical side: there is also a moral and social side. And here the most correct evaluation can only be given by the people, who in the greatest measure have a healthy instinct for self-preservation. If the Rostov nuclear plant goes into operation, then millions of people living along the Don and the Azov shore will lose their peace of mind. The moral aspect is inevitably transformed into an economic one: a deterioration in the social state of health and a drop in working ability.

But the fact that the nuclear service is being restructured is indicated by the following new aspect of its activity. Before, it was considered unpatriotic to mention the possibility of a disaster. Now, go ahead. There have even been survival classes around the Rostov Power Plant.

Evidently so that people can become accustomed to living in permanent fear. Actions according to cheerful signals have been worked out (official lyrics have not yet come to an end): "cucumber": disperse and take shelter in trenches; "branch": a nearby evacuation; "broom": a distant evacuation... With 50 kilograms of baggage per person... "So that's how we now will have to live with the 'ecologically cleanest' power," the writer Anton Gerashchenko expresses the fears of the residents. The Tsimlyansk pensioner S. A. Lopukhin is more categorical: "Other than these survival 'instructions' we were given no means of individual protection, or radiation level measurement instruments. So people are supposed to sit by their radio day and night waiting for the danger signal? Clearly, we are still completely unprepared for this..."

"The "Defense Witness" F. Yalaletdinov, deputy chairman of the Rostov Public Ecological Center: "Survival must no longer depend on the decisions of technocracy. It's time for us to finally understand that the people are competent in the most important thing: how to survive and live."

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Pollution Statistics for Azerbaijan Summarized

90WN0193A Baku BAKINSKIY RABOCHIY
in Russian 15 Jun 90 p 4

[Article by A. Aliyev, chairman of the Azerbaijan State Statistics Committee: "On the Ecological Situation in the Republic"]

[Text] In recent years in the republic in the aim of improving the ecological situation, conservation activities have been somewhat intensified. In 1989 alone, over 100 million rubles were spent for protecting the environment (including expenditures on forest management), and this was 22 million rubles or more than 1/5 above the 1985 level. During the current five-year plan, in comparison with the previous one, the annual average volume of these expenditures has increased by 11 percent, including by 19 percent for capital investments. Some 1.4 percent of the total investments for the national economy was spent on environmental construction in comparison with 0.7 percent in 1985. However, at present the share of all conservation expenditures in the gross national product of the republic, as in previous years, is just 0.7 percent. The allocated funds as before are significantly underutilized.

In 1989, stationary sources in the republic discharged into the atmosphere some 925,000 tons of harmful substances (in 1985, 914,000 tons), or 11 tons per unit of area and this surpasses the average Union indicator by almost 4-fold. The pollution level of the air basin in the republic industrial centers remains high, particularly in Baku, Sumgait and Gyandzha. As an average per inhabitant of the capital, 1.8-fold more harmful substances is released into the atmosphere than the Union level and 1/4

more for Sumgait. In these cities, the content of certain harmful substances in the atmospheric air surpasses by several fold the maximum permissible concentrations. Over the last 4 years, according to the estimate of the USSR Goskomgidromet [State Committee for Hydrometeorology], Sumgait has twice been among the cities of the nation with the most polluted air basin. The high degree of polluting of the air basin by the industrial enterprises has been caused by their poor equipping with scrubbers a significant portion of which in addition operates inefficiently. As a whole for the republic, up to 1/2 of the harmful substances generated by the stationary sources is recovered and processed in comparison with 77 percent as an average for the nation. The bad ecological situation in the industrial centers is one of the main causes of the high sickness rate. For instance: the sickness rate of the urban population with malignant neoplasms is 4-fold higher than the rural and the mortality rate for this factor is 1.5-fold higher.

The situation is no better with the water resources. With an acute shortage of water in the republic, around 1/4 of the water intake is lost in transporting. In agriculture which is responsible for over 2/3 of the republic water consumption, some 26 percent of the water is lost.

The republic is not doing enough to introduce the recirculating and successive reutilization of water which provides a substantial savings in water and a reduction in the polluting of bodies of water. The share of this water in total water consumption for production needs is just 37 percent, while for the nation it is 72 percent, Armenia 84 percent and Georgia 47 percent. The question of preventing the polluting of the republic bodies of water is being slowly solved.

Last year some 291 million m³ of polluted waste was discharged into the basin of the Caspian Sea. Here the content of a majority of polluted substances in the Azerbaijan waters of the Caspian Sea significantly surpasses the maximum established concentrations.

Serious attention must be paid to the measures of protecting and improving the land, for at present 44 percent of the entire republic's area is afflicted by erosion, some 2/5 of the irrigated farmland is salined and 20,500 hectares have been disrupted by the oil production, ore mining industries, construction and other types of work and require recultivation. However, in maintaining the rate of work established in recent years for recultivating the land destroyed prior to 1990, more than 20 years will be required.

For improving the ecological situation existing in the republic, we must significantly increase expenditures on environmental protection. In the long run, the capital investment volume for conservation measures should be increased by 4-5-fold.

Goals of Azerbaijan Greens Movement Explained*90WN0193B Baku BAKINSKIY RABOCHIY**in Russian 15 May 90 p 3*

[Article by Dzh. Guseynov: "The Greens Are Beginning...."]

[Text] "Our mineral wealth has been bled white, the land has been poisoned and turned into a garbage dump, the seas are being suffocated by sewage which is released in millions of cubic meters while the air pollution in industrial centers is becoming the cause of numerous illnesses.

"The question of the need to join all the forces of society favoring the protection of the unique nature in Azerbaijan; the environment, the health and life of the citizens has become unusually acute.

"We who currently live in Azerbaijan bear responsibility to ourselves, to our children, to our grandchildren and future generations for protecting the basic conditions of life."

This is an excerpt from the program of the Azerbaijan Greens Movement the constituent congress of which was held on 6 May in Baku. During the meeting in the auditorium, not everything was quiet and boring. Scientists and public figures, workers and peasants spoke with pain about the catastrophic state of nature in the republic, they named specific facts and guilty parties in the destruction of nature, and offered ways and forms for carrying out the difficult tasks of the rational use of natural resources, reducing the pollution of the environment with foreign chemical substances, radiation and noise.

Of course, there were disputes and debates. But a majority voted in favor of creating an independent social organization which would wage an uncompromising struggle against the bureaucratic-consumer attitude toward nature, against the monopoly of the ministries and departments, against their gigantic expensive and resource-wasteful programs leading to the destruction of the natural and cultural-historical environment and not considering either the economic, the social or cultural interests of the population.

One of the important tasks of the DZA [Azerbaijan Greens Movement], as was emphasized at the congress, is to instill ecological awareness in the republic population, and to form relations between man, society and nature which are based upon a mutual harmony.

The Azerbaijan State Committee for Environmental Protection (Goskompriroda), the Republic Ecological Union and the Sumgait Ecological Movement offered to provide aid and a desire to collaborate with the DZA.

The basic backbone of the movement formed a year ago under the aegis of the ecological club with the coming together of the youth, the students Rufat Karagezov and Elman Abdullayev and the young scientists Leyla

Aliyeva, Ismail Rustamov, Bakhar Gadzhi-zade, Farida Guseynova and many others.

"Everything began in March of last year," recalled Ismail Rustamov, one of the initiators of the movement and a member of its current board. "Initially we called ourselves an 'ecological club' under the Baku Arts Center. We are very grateful to the center for the fact that it immediately supported our idea and providing meeting rooms. Like-thinkers assembled and we ardently and passionately discussed the problems which had built up in the republic over the long years of the utilitarian approach to nature. In the disputes, we outlined the ways and forms of our further activities.

"Then we began to carry out various actions and measures in the defense of the environment. Much, in truth, did not turn out well for us, initially no one supported us and took us seriously. For example, in September of last year, we conducted two actions to collect signatures for an appeal to the republic Council of Ministers with a demand to halt the construction of the reservoirs in Tauzskiy, Kazakhskiy and Lenkoranskiy Rayons. As a result of this, valuable varieties of trees would have been felled. Enormous areas of forests and fertile soil would have been doomed to covering by water. But still we have not received an answer to the appeal which was signed by more than a thousand persons."

The Greens have realized that without a broad, strong republic-wide movement, it would be hard to fight against those who were fighting nature. The organizational preparations began for the future movement. And then there was the first practical action. On 26 November, on the street an "ecological" protest march was held against the supposed "cleaning" of the bay. The data of an independent ecological impact assessment showed that the silt which was collected from the bottom of the bay was then dumped back into the sea in the area of Nargin Island. This silt contained toxic concentrations of industrial waste. This project, if one can call it so, for cleaning up had been signed by the Committee for Environmental Protection.... The declaration of the Greens was momentarily responded to and they were even invited to a meeting with the ecological commission of the Baku Soviet. It was promised that this question would be raised at the next session of the Baku Soviet and the fellows would be provided with an opportunity to speak. However, 5 months have already passed....

On 4 December, the activists in the movement participated at the Greens Congress in Moscow where they prepared a stand describing the state of the environment in our republic and showed a documentary film entitled "Dead Zone" about Sumgait. A number of proposals from the report of Akif Abbasuliyev who spoke on behalf of the club was incorporated in the congress resolution.

Strong professional contacts were established with the Socioecological Union of the nation and with the Greens Movement in Georgia. This summer they plan to hold a

working expedition up the Kura together with the editorial personnel of the Georgian youth newspaper. The activists are participating in preparing a collection of articles and documents on the ecological situation in the Soviet Union. A chapter on Azerbaijan has been prepared by Elchin Atababayev, a member of our movement's coordinating council.

What tasks have been set by the Greens? In the first place, as is apparent from the program and the bylaws of the movement adopted at the congress, they are against the monopoly of the administrative-command apparatus on taking decisions related to questions of the republic's socioeconomic development, on the collection and dissemination (or more accurately "concealment") of information on the state of the economy, nature and the health of the people and on supervising the observance of current legislation.

"As a counterweight to this," concluded Leyla Aliyeva, "the movement intends to collect objective information on the ecological situation in the republic and on the basis of this establish an ecological data bank available to anyone who so desires to use it. Using our own funds, we are organizing field laboratories and technical inspection over the sources of polluting nature. We will discuss all draft documents relating to the construction of natural and economic projects which can cause harm to nature, we will call in specialists for the public impact assessment commissions, and seek to make provision in the nation's legislation for the right to bring suit in court and arbitration against institutions, enterprises, ministries and individuals who violate the natural background, pollute the environment and thereby harm human health."

And so the Greens are beginning and we are very hopeful that they will win. Certainly each victory of theirs is your and my health and possibly our lives, as well as the saved unique nature of Azerbaijan with its forests, steppes, lakes and the Caspian.

Yeltsin Visit Highlights Sterlitamak Pollution Problems

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First Edition p 2*

[Special correspondent N. Morozov dispatch under the rubric "Emergency Situation": "In a Toxic Fog"]

[Text] Bashkir ASSR [Autonomous Soviet Socialist Republic]—I smelled the breath of the large chemical industry city long before we arrived at Sterlitamak. As we drew near the industrial giant—the Kaustik Production Association—I began to feel slight nausea.

"You are lucky, there is a slight breeze today, one can still breathe," the chemical industry workers "reassured" me. "On a still day, we and the local inhabitants have problems..."

August 8 turned out to be such a still day and it triggered a social storm in Sterlitamak.

...In the morning a bluish gray fog started creeping toward the city from the direction of the industrial zone. There was a distinct smell of chlorine. Two hours or so later it settled on the whole city.

People telephoned Kaustik, the synthetic rubber plant, and the Soda Association, asking where the discharge of gas was coming from. The two neighboring chemical industry plants started accusing each other, while the enterprise managers declared with Olympian aloofness that all was normal at their plants as regards ecology.

You may wonder, what kind of "normality" was A. Islamshin, chief engineer at the Kaustik plant, talking about if, for instance, according to the local press 33 production shops of this association are operating without the sanction of the state hygiene service, and if for many of the toxic products that are being discharged into the atmosphere there is not even a method to determine the highest permissible concentration?

In the afternoon columns of demonstrators formed spontaneously, consisting mainly of women concerned about their children's health. They marched to the city center where a noisy rally took place in front of the building of the city soviet executive committee and the city party committee. The city fathers promised to take urgent steps to identify the source of the sudden discharge of chlorine and to close down the offending production unit. The presidium of the city soviet of people's deputies met for an emergency session and, having discussed the prevailing state of affairs, declared an ecological emergency in the city as a result of strong gas pollution. A provisional emergency committee was set up.

The outrage of the inhabitants of Sterlitamak is understandable. Its essence was, in my opinion, aptly expressed by O. Pershin, a city soviet deputy: "For more than three years we have been struggling to achieve an improvement of the ecological situation in the city and the region. And what is the upshot? USSR Council of Ministers Resolution No. 781 on improving the ecological situation in Sterlitamak and Salavat is not being implemented, the decisions of last year's conference with Comrade Gusev, deputy chairman of the USSR Council of Ministers, remain only on paper, and the same applies to Bashkir ASSR Council of Ministers Resolution No. 182. Now, as in the past, there is no foreign currency to retool production units..."

Apart from demands for an immediate improvement of the ecological situation, demands of a political nature also rang out at the rally. They included the resignation of the current leadership of the city soviet and city party committee and the handing over of the premises which they currently occupy to house a medical establishment. A city strike committee has been set up which will organize a citywide strike in a month's time if the resolution adopted at the rally is not implemented.

B. Yeltsin, chairman of the RSFSR [Russian Soviet Federated Socialist Republic] Supreme Soviet, arrived in the chemical industry workers' city 11 August.

"I have been touring Tataria and Bashkiria for a week, but nowhere have my impressions been so gloomy, especially during my visit to the Kaustik plant. It is depressing, frankly painful," he said at a meeting with inhabitants of Sterlitamak and surrounding villages.

The meeting between the head of the Russian parliament and the working people opened in the hall of the synthetic rubber plant's center, but it had to be continued outside. Several thousand people who wanted to know how the ecological emergency would be dealt with had gathered, and Boris Nikolayevich had no choice but to conduct a dialogue with an audience of several thousands from the roof of the entrance lobby of the center.

The speaker saw the cause of the current ecological disaster in the immoderate financial appetites of union ministries and departments. For instance, the self-same Kaustik plant, which needs major capital investments for environmental protection measures, is allowed to retain only 10 percent of its total profits. This is downright robbery, B. Yeltsin said. The enterprise must be the proprietor, it must not only own its fixed capital but also be allowed to control its output, to sell it advantageously, to handle its foreign currency earnings, and to spend them as it sees fit. The chairman of the RSFSR Supreme Soviet said further that the Russian Government has already rejected the services of 60 union ministries and halved the apparatus of republican ministries. At the upcoming September session of the Supreme Soviet, a law is to be adopted on taxation, which will reduce the financial pressure exerted by the state on enterprises. It is proposed to reduce the rate of taxation on profits from 45 to 35 percent.

"The program for switching the economy to market relations proposed by the government headed by Ryzhkov is too much for the people to bear," Yeltsin noted. "The people need a reform which will not infringe upon their interests. The Russian Federation Government has such a program."

Among other measures to stabilize the economic situation in the course of 500 days, B. Yeltsin mentioned decentralization of management, establishment of contractual economic ties between republics, and adoption of a law on ownership which makes provision for recognizing private ownership on a par with other forms of ownership.

Naturally, the inhabitants of Sterlitamak who are suffering so much from harmful emissions expected specific proposals to overcome the ecological emergency from the head of the Russian parliament.

"Boris Nikolayevich did not say enough about Sterlitamak's problems," one citizen said in a mini-interview. "When you are speaking from that height, our problems are not visible," another said ironically. But most of the

people I talked to said that the meeting had been useful. "B. Yeltsin intimated that our salvation lies in complete independence. In sovereignty which will be approved and backed by Russia. It was important to hear at first hand about the future course of the Russian parliament, whose experience will no doubt come in useful also for Bashkir deputies," said N. Nigmatullin, a war and labor veteran.

B. Yeltsin left Bashkiria for Vorkuta.

Ufa Rally Calls For Chemical Plant Closure

LD3008215290 Moscow Domestic Service in Russian
1800 GMT 30 Aug 90

[Text] Today thousands of Ufa residents came out for an authorized rally that had been organized by a joint committee of public organizations and the Kirovskiy Rayon CPSU Committee. Until late in the evening people were standing outside the building of the social and political center with placards and slogans: We do not trust the government of Bashkiriya, which is being led by the union ministries! People's deputies! What are you waiting for? Urgently support the decisions of the session of the Ufa City Soviet of People's Deputies on closing down chemical production. If you do not solve the ecological problems in the near future, we will solve them ourselves!

A few days ago an ecological accident happened in Ufa. The phenol and acetone production unit at the synthetic alcohol works exploded. The air, water, and soil are poisoned. Over 120 people have been hospitalized with injuries and burns. Residents were left without drinking water. The citizens of Neftekamsk, situated at a distance of 200 km from Bashkiriya's capital, came in buses to support the rally of Ufa residents.

Yeltsin Applauds Kamchatka Ecological Efforts

LD2608155790 Moscow TASS in English 1413 GMT
26 Aug 90

[by TASS correspondent Sergey Borovkov]

[Excerpt] Petropavlosk-Kamchatskiy, Soviet Far East, August 26 TASS—Russian President Boris Yeltsin visited the geyser valley on the Kamchatka Peninsula in the morning today.

The unique valley, which is part of the Kronotskiy Nature Reserve, has for the last 15 years been closed to tourists for fear they can disturb its delicate ecological balance. Exceptions have been made only for scientific expeditions.

Yeltsin was shown waterfalls, geysers and the caldera of the Uzon Volcano with a thermal lake.

The president said that "places like this should be shown to people to foster their love of nature," but he warned against excessive commercialisation in the reserve.

He said with bitterness that the environmental situation in the Russian Federation had made an "oppressive" impression on him during his current trip.

"Many places will never be restored, this is why the work of Kamchatka scientists in cooperation with the local authorities shows a good example of how one can, and should, protect nature in places where it has not yet suffered from anthropogenic and technogenic effect," Yeltsin said. [passage omitted]

Allegations of Radiation Hazards at Uzbek Ore Mining Works Explored

90WN0194A Tashkent KOMSOMOLETS
UZBEKISTANA in Russian 7 Jun 90 p 3

[Interview of Valentin Yegorovich Latyshev, chief of the Central Scientific Research Laboratory of the Mining-Metallurgical Combine, by Stanislav Rukhmalev, member of the USSR Journalists' Union: "Chernobyl in the Kyzylkums"]

[Text] It is no secret that Navoi is among the cities with a bad ecological situation. Here the main polluters of the environment are the production association Navoiazot [Navoi Nitrogen], the electrochemical and cement plants and the hydropower plant.

The mining-metallurgical combine also does its bit. For long years, this enterprise has been considered "classified" and has been beyond the reach of glasnost. Now the secrets have been removed. More and more frequently information appears in the press on this unique enterprise the subdivisions of which are located in four towns: Navoi, Zarafshan, Uchkuduk and Nurabad. In truth, the information on the activities of the miners and their impact on ecology often is of a contradictory sort. Recently, for example, the respected republic journal MUSHTUM published a letter from M. Mardiyeu to the combine director and USSR People's Deputy N. Kucherskiy. The author of the article stated that supposedly the ore mined in the Kyzylkums "creates a radiation background here comparable in the future with the background of Chernobyl." Naturally this could not help but cause panic among the public. In the local authorities, the newspaper editorial offices and the corresponding services of the combine, the telephones began ringing from alarmed inhabitants of the region.

We turned for an explanation to the Chief of the Central Scientific Research Laboratory of the Mining-Metallurgical Combine V.Ye. Latyshev. He is a candidate of geological-minerological sciences and a member of the USSR Nuclear Society. One of the tasks of the service which he leads is to monitor the combine subdivisions for the ecological state of the work area and for discharges into the atmosphere.

"Along with us similar monitoring is carried out by special laboratories from the subdivisions and by the sanitary-epidemiological center of the combine's Central Medical-Sanitation Unit," said Valentin Yegorovich

[Latyshev]. "Independently of one another, they perform periodic measurements of the gamma background using instruments such as radiometers and the taking and analysis of soil samples for the content of radioactive elements. The results of these measurements are compared against the background values. The background points are located a great distance away from the cities. In particular, for the town of Navoi this is the areas of the stations of Ziatdin, Malik and Khazara. This excludes the influence of the enterprises on changes in the background points. The Navoi Mining-Metallurgical Combine," continued V.Ye. Latyshev, "produces raw materials, including radioactive elements. For this reason, systematically, from the very moment of the establishing of the enterprise, we have been engaged in studying the radiation situation at the industrial sites and in the housing areas of the adjacent territory. Let me point out that radioactive elements are widespread and ubiquitous in the earth's crust and are present in various contents in virtually all rock and soils. For this reason, on any territory and at any point of the surface there is a natural radioactive background which is composed of the power of the dose of the gamma radiation of the rock and soil and cosmic radiation.

"For the town of Navoi the last measurements were made in August of last year. None of the 550 studied points which covered the entire territory of the town had an exceeding of the natural background which is 15-20 microroentgens per hour. Analogous measurements were made previously in 1968, 1974, 1982 and 1986. The radiation situation according to all the previous measurements was also normal and did not differ from the background. There was the same situation in the towns of Zarafshan, Uchkuduk and Nurabad."

[Rukhmalev] Valentin Yegorovich, are you studying the radiation situation solely with your own forces? Or have you turned for aid to the leading research institutes of the nation?

[Latyshev] Undoubtedly, such enormous and responsible work is beyond the power of us alone. And for this reason we have also needed the support of authoritative specialists. Their experience, advice and recommendations are very important.

"In 1988, the All-Union Scientific Research Institute for Chemical Technology carried out an aerial survey in Navoi by taking air samples and analyzing them for radioactive elements. They did not discover any excess in terms of the content of radioactive elements. Last year, analogous work was carried out by specialists from the Leningrad Institute for Maritime Transport Hygiene. No deviations from the standard were detected."

[Rukhmalev] The town dwellers are particularly concerned by the tails storage at the hydrometallurgical plant in Navoi. What is the radiation situation here?

[Latyshev] The sanitary-protective zone around this tails storage is about 800 m deep and according to the data of periodic surveys completely protects the territory

beyond it from pollution. Within the sanitary-protective zone lies the plant's subsidiary farm where they grow and sell to the enterprise employees potatoes, onions, carrots and melon crops. The products have been inspected for pollution. There was no exceeding of the standards.

"The combine possesses all of the necessary equipment and skilled personnel for the ongoing survey of the territories in the zones of their subdivisions. There should be no reason for alarm for the inhabitants of Navoi and the other adjacent towns and population points over the question of the radiation situation.

"We, in turn," said V.Ye. Latyshev in conclusion, "are endeavoring to put the information on a level necessary and accessible for all. For this we will use local television, the press and meetings between specialists and residents. On the questions of radiation safety for the public, it is essential to have a correct, competent approach based upon a knowledge of the essence of the problem and reliable information. Only in this instance can we count on trust."

Bacteria 'Worse Than AIDS' Forces Tashkent Metro Station Shutdown

*LD2808201590 Moscow Television Service in Russian
1430 GMT 28 Aug 90*

[From the "Vremya" newscast. For previous reporting on the Tashkent Metro Station pollution question, see the JPRS series SOVIET UNION: POLITICAL AFFAIRS, JPRS-UPA-89-048, dated 28 July 1989, pages 67-69, and JPRS-UPA-89-059, dated 14 November 1989, pages 67-70. For previous reporting on Professor Dekhkan-Khodzhayeva's mycological research, see the JPRS series SOVIET UNION: POLITICAL AFFAIRS, JPRS-UPA-88-010, dated 1 March 1988, pages 114-120, and JPRS-UPA-90-008, dated 14 February 1990, pages 85-87.]

[Text] At the beginning of this year, the Chkalovskaya Station, and then the Selmarshskaya Station [shown on video as Tashselmash - Tashkent Agriculture station] on the second line of the Tashkent Metro were urgently closed down. Today, these expensive underground installations are completely sealed. Well, what happened in our subway? Our correspondent Mukhtar Ganiyev reports.

[begin recording] [Ganiyev] Complaints from the workers of the Chkalovskaya Station of headaches and poisoning were the first symptoms of the extraordinary event. Then the same thing began to happen to passengers. The station was closed. A commission was formed and scientists were invited. There are many industrial enterprises alongside the station. They began to seek the cause of the misfortune in their effluents. Scientists worked for a year and by that time the signs of misfortune appeared at the Selmarshskaya Station, too—unpleasant gas, poisoning—and it was closed as well.

[N.N. Stepanichenko, chemist—captioned] The more acceptable, the more widely acknowledged version now is that an extensive biological reactor is at work in the tunnel space of the subway stations.

[Ganiyev] It is a unique and very serious case. The concrete installation was, as it were, a barrier on the ancient migratory path of the microorganisms, and nobody knows what harm the biological reactor in the seething bowels of the earth may yet arouse. One thing is clear. They have already begun to wreck the concrete of the underground and to poison the human organism. According to the analysis of epidemiologists and microbiologists from Kiev, there are molds [grib] among the bacteria which are very dangerous for human life.

[Professor N.A. Dekhkan-Khodzhayeva—captioned] Thirty-two patients from the Chkalovskaya Metro Station have been examined. Various species [vid] of mold have been isolated from the sputum of 14 of them, while a new species of mold—(?pitilomatis variote)—has been isolated in the blood of four of them. This mold is very aggressive, and attacks not only all internal organs but also all blood cells. By its nature, it is even worse than AIDS.

[Ganiyev] Train drivers are ill and the expensive stations are closed. But nobody knows what shock that biological reactor may yet give rise to at the stations of the Tashkent Metro. Nature does not forgive us our mistakes. [video shows the subway stations closed, a tunnel being demolished, street scenes, and interviews with scientists. [end recording]

Railways Ministry Denies Tashkent Metro Microbe Claims

*LD3008163290 Moscow Domestic Service in Russian
1356 GMT 30 Aug 90*

[Text] Representatives of the Union Ministry of railways have denied claims that the subway in Tashkent is allegedly infected with mysterious molds and microbes which eat away the structures and are dangerous to people. They have even been compared to AIDS. Nothing of the sort has been discovered in the stations and on the subway lines of the Uzbek capital.

It has been established that no kind of microorganisms, but methane and other gases interacting with compounds in the subway atmosphere, are having harmful effects.

Use of Particle Accelerators To Reduce Nuclear Waste To Be Studied

*OW3108063490 Moscow International Service
in Mandarin 0600 GMT 5 Aug 90*

[From the "Soviet World of Science and Technology" program]

[Text] Finally, let us talk about solving one of the most important problems of our time: finding unique ways to

render harmless radioactive waste of nuclear power plants. A method was developed by scientists of the Physical Technical Institute of the Ukrainian Academy of Sciences. The method involves the use of particle accelerators.

In addition to the large linear electron accelerators at the institute, the institute recently purchased a number of small linear electron accelerators. Each small linear electron accelerator has a power of tens of million electron watts. As far as design and efficiency are concerned, some of the equipment is even better than the best foreign products. The emergence of these accelerators brought about a very appealing idea: using the technology and means to render harmless nuclear fuel, nuclear waste, and other radioactive materials.

The scientific theory for solving this problem is very simple. As we all know, a nucleus is made up of a specific number of protons and neutrons. Under normal conditions, the protons and neutrons are tightly linked. However, in an unstable nucleus, or radioactive nucleus, there is a surplus or deficiency of neutrons. Based on this fact, scientists have considered using particle beams travelling at the speed of light to continuously bombard radioactive waste in an attempt to eliminate surplus neutrons in a nucleus, or to make a nucleus deficient in protons, so that the nucleus will become neutral.

In accelerators, accelerated electrons, when colliding with radioactive waste, release high-wattage gamma rays. These gamma rays can eliminate long-life radioactive substances such as (?cobalt) and (?strontium). As these radioactive substances are a very small part, although the most dangerous part, of nuclear waste, it is easy to eliminate these substances in a selective way. Other radioactive substances decay in a relatively short time.

Specialists have suggested that accelerators capable of rendering harmless radioactive nuclear waste be installed in tightly sealed nuclear power plants. The important thing here is to keep costs at a minimum. Nearly all of the power generated by nuclear power plants should be used to produce consumer goods. Only a small fraction of this power is needed to neutralize nuclear waste. To reduce nuclear waste to a minimum, it has been decided to further burn used nuclear fuel, although this process will lower the production efficiency of nuclear power plants. Besides, if we can find a way to detect the hidden radioactivity released by the Chernobyl Power Plant, no one would give much thought to [words indistinct].

The Physical Technical Institute of the Ukrainian Academy of Sciences plans to conduct its first experiment this year. For this, the institute is modifying some accelerators and selecting some suitable equipment. According to experts, some complicated research work will be required for quite some time.

FEDERAL REPUBLIC OF GERMANY

GNP Statistics Adding Ecological Components

90GE0245A Munich SUEDEUTSCHE ZEITUNG
in German 19 Jul 90 p 27

[Article by free: "Federal Office of Statistics Compiles Ecological National Account"]

[Text] Bonn, (from our own correspondent)—The computation of the gross national product is to be expanded to include ecological components. The concept of a total ecological national account was introduced by the President of the Federal Office of Statistics, Egon Hoelder, in conjunction with Federal Minister of the Environment, Klaus Toepfer (CDU [Christian Democratic Union]), in Bonn. The goal is to detect the status of the environment and changes that occur within it, and to present the interactions between economic activity and the environment in such a way that they can be compared and analyzed.

It should be possible to determine, for example, whether economic growth of four percent was associated with a greater or a lesser degree of air pollution. Mr. Toepfer spoke of a "test of environmental tolerability for the gross national product." In Mr. Hoelder's words, far-reaching results cannot be expected for another two years.

Report Section and Analysis

The point of departure for the system is that the effects of economic activity on the environment have not yet been taken into account as a cost factor in the national accounts—they trace the development, distribution, and use of the gross national product as the total value of all the products produced and all the services performed in a given year. This may be considered a disadvantage, because, in the meantime, the environment has come to be considered a scarce commodity that is not available for unlimited use; nevertheless, however, thus far the means of placing a value on the environment, as one would place a value on any other commodity, have been lacking. As a sort of expanded cost-benefit analysis for economic well-being, the new system will contribute toward determining, by economic means, the consumption of resources for economic activities, toward determining the resultant changes in the environmental situation, and the cost associated with pollution in terms of damage done to the air, the water, and the soil. At the same time, the contribution made by economic investment toward cleaning up the environment can be shown as well.

The draft proposal being advanced by the Federal Office of Statistics is divided into two parts according to Mr. Hoelder: the Statistical Environmental-Economic Reporting System (Stubs), and the analytical portion. In the reporting segment, data on the environmental situation (such as the emission of sulphur dioxide, measured in tons) are gathered, prepared according to uniform

classifications (pollution of the soil, the water, and the air), and, if possible, expressed in terms of DM. Evaluation by marks and pennings should, according to Mr. Hoelder, serve the purpose of creating a basis for comparison with the processes of national accounting, as they are applied in the national economy.

The reporting segment is to consist of ten building blocks (modules), which include such components as the consumption of resources, extreme stresses, measures to protect the environment, or an emissions model, for example. This method of proceeding would leave the possibility open to add new building blocks at any time. The analysis segment deals with interconnections with the national economy's accounts.

Mr. Hoelder expressed no doubts that placing a value on ecological damage in monetary terms would create considerable problems and give rise to many discussions, because, he said, evaluating the information would necessitate political decisions. The Federal Office of Statistics suggests using market prices as a basis for breaking down and consuming raw materials. In the case of emissions (solid waste, waste water, exhaust emissions), the cost of damage avoidance should be the basis of evaluation, that is, those costs, for example, incurred in removing sulphur from exhaust fumes resulting from fuel burned in the generation of electricity per kilowatt hour. In the case of other pollutants introduced into the environment, for example, in the case of contaminated soils, the costs of the repairs should serve as a yardstick.

"Practically no Precedent"

In Mr. Hoelder's view, the intent is not "to have new statistics rain down upon the economy." The requisite information would not have to be collected again; he said it was already available, even if it was scattered. The information would be coordinated and reorganized in conjunction with the national accounts. In Mr. Toepfer's words, however, the environmental statistics law would have to be newly framed; he said a draft that met those requirements was nearly ready. Data from the Federal Laender, which heretofore have not been made available to the Federal Government, would have to be incorporated into the system. Mr. Toepfer let it be known that there were still problems in this regard. He said the laender basically agreed that the new system was necessary. Mr. Hoelder said there was "practically no precedent" for the new accounting system. He said that a wide variety of theoretical and practical problems still lay before the statisticians. He added that was why comprehensive results would not be available for another two years at the earliest, results that could supplement the results published in January. He stated that building blocks for the system were available at an even earlier date. Mr. Toepfer also considers that there will be further delays in publishing figures on economic growth and data on a national accounting of the environmental economy.

NORWAY

Minister Examines Repercussions of Biotechnology on Environment

90WN0230A Oslo AFTENPOSTEN in Norwegian
25 Jul 90 p 2

[Article by Minister of Environmental Affairs Kristin Hille Valla (Sp): "Biotechnology and the Environment"]

[Text] Can organisms that have been gene-modified be especially dangerous to their environment? Scholars are at odds about that. Biotechnologists point out that an organism's characteristics, and not the way it is produced, determine whether it is dangerous or not. Others point out that the new technology can easily lead genes along "wild paths," and that we still know too little about the consequences the use of present-day technology can bring about. Ecologists refer to the fact that the exposure of strange organisms will affect the natural environment. The disputes cannot be settled with a "yes" or a "no" to modern biotechnology. The challenge to control how that technology is to be used in a justifiable way is in accordance with the principle of acting in a prudent manner.

To prevent rather than repair is the primary message from the World Committee for the Environment and Development. In Norway, biotechnology has barely gotten out of the research laboratory. If there is to be a new growth industry, it must be based on our ecological knowledge. We cannot accept having the prospect of short-term profit take precedence over the environment and ethical standards in society.

Industrial Effluents

At present, it is difficult to foretell how a gene-modified microorganism will behave if it escapes from the laboratory by accident, for example. The peril most frequently cited is the danger that an organism will be able to cause illness. It is claimed that the environmental effect would be minimal because organisms that are modified for laboratory use are not believed to be so competitive in their nature that a small discharge can cause propagation and massive diffusion. Consequently, they have accepted, in Denmark, small, frequent discharges of gene-modified microorganisms from Nordisk Gentofte that produce human growth hormones and microorganisms from Novo that produce human insulin, for example. However, survival tests that were made after the plants received permission to produce them showed that the gene-modified organisms managed much better than had been expected. The demand for zero discharge is now being made by neighbors of the industrial installations and by organizations in Denmark and other countries. In Germany and the United States, many industrial installations have even imposed zero discharge injunctions on themselves to avoid protests by the public.

Deliberate Exposure

Experience with the exposure of foreign organisms in nature show that they can produce unexpected environmental damage in the absence of natural enemies at the point of release. The water thyme aquarium plant from North America is an example of the release of a foreign species that has caused great negative consequences in many water systems in East Norway. The plant has ousted indigenous aquatic plants and created big pollution and overgrowth problems.

Ice-minus bacteria are the first gene-modified microorganisms that were permitted to be released in a field experiment in the United States. The background for this case consists of the fact that the frost bacterium *Pseudomonas syringinae*, which is found in large numbers on leaves and fruit, has a protein that forms nuclei in ice crystals. The absence of that protein makes the plants able to tolerate temperatures down to -50 Celsius. Ice-minus bacteria are made by removing the gene that creates that surface protein.

When the gene-modified organisms are sprayed over fields, the plants will become more tolerant of frost as a result. However, that triggered violent discussions for and against exposure because the ecology, the local climate, growing conditions and especially individual rights and working conditions in agricultural enterprises can definitely be affected.

Experience gained during the debate concerning the ice-minus bacterium showed the need for working out consistent considerations to be taken into account when exposing gene-modified organisms. Furthermore, that experience showed that there is a need for proper testing of experimental organisms in closed environments and small experimental fields before dispersion in a natural environment.

Since unexpected consequences can occur, such experiments should also provide us with a chance to pull back by means of methods of controlling and putting a stop to possible spreading of the organisms, among other things.

Regulating

The Biotechnology Board pointed out in its main report (NOU 1990:1) that the dangers involved in gene technology, from the environmental point of view, are primarily connected with the following:

An increased danger of spreading disease among plants and animals through infection by organisms that cause disease.

Changes in the ecological balance in an area because of the releasing or exposing of organisms that can change a state of natural competition among species.

Changes in the genetic multiplicity among naturally-occurring and/or cultivated species by the releasing or exposing of individuals with a uniform gene material.

The board proposed that modern biotechnology should be controlled through regulations. The government has followed up that proposal with a Government resolution on biotechnology that was accepted by the Cabinet on 13 July 1990. A separate law on gene technology that contains a general prohibition of the exposure of gene-modified organisms is proposed there. Exceptions can be made in the case of projects that are useful to society after individual consideration has been given to the ethical consequences where health and the environment are concerned.

A condition for the making of exceptions must be that minimal danger of undesirable ecological effects and undesirable diffusion of organisms or their genetic material exists. Therefore, consistent considerations to be taken into account shall include, among other things, consideration of what ability an organism has to survive, establish itself and spread itself or its genes in the natural environment.

Whether organisms, or substances that they produce, are poisonous or have the ability to cause disease, and what ability they have, in addition, to affect the natural environment is also important.

Foresight and Openness

The future is now. That linguistic anomaly is scarcely more meaningful anywhere than it is in regard to the possibilities the modern biotechnology raises. Plants and animals with other characteristics than those with which nature equipped them are already being created now. Those possibilities are being developed very rapidly, and important parts of knowledge and techniques can also be used in medicine for humans. The possibilities that such a boundary-shattering technology entails call for political responsibility and a vigilant public. We must get a proper regulation that ensures foresight and thorough consideration of the consequences to get safe and reasonable use of the new technologies. In the international context, Norway should emerge as an active and corrective force in the use and development of biotechnology in the '90's.

Support, Incentives To Promote Cleaner Technology Detailed

90WN0230C Oslo AFTENPOSTEN in Norwegian
28 Jul 90 p 16

[Article by Lene Skogstrom: "Money for Clean Technology"]

[Text] With the help of both the carrot and the stick, industry will learn new, environment-friendly ways of thinking. The Minister of Environmental Affairs has promised to invest money in a "Cleaner Technology" program.

Preventive protection of the environment is the big, fashionable phrase at the moment, but many firms are continuing along the same old path and are refusing to

think along new lines. Our experience has been that many wait to comply with requirements and orders until it is too late, and they choose the traditional solution: one more "cleaning gadget" in the end of a pipe or tube.

"Up to the present, we have concentrated on removal. Now we must change over from just asking questions about discharges to going through the entire production process, from raw materials to the finished product," Minister of Environmental Affairs Kristin Hille Valla says. And the former teacher is making use of pedagogical methods to obtain a change of attitude in industry. Prohibition, checking and stimulation are pertinent catchwords—with more emphasis on the latter two than formerly.

More Rigorous Checking

The licensing practice of the National Pollution Inspectorate (SFT) has been changed. From now on, firms that ask for new discharge permits will be called upon to give an account of the environmental problems connected with all their operations.

Can more environment-friendly raw materials be used? Are there possibilities for economizing on energy? Are there processes and products that are less harmful to the environment, and can the production of waste be reduced?

Many "Carrots"

In 1990, for the first time, 26.5 million kroner will be set aside for the "Cleaner Technology" program—money that will be used for testing technology that can reduce pollution at the source or prevent it from occurring.

The 1990 bill regarding the distribution of the money produces an initial impression that there will be a distribution of small allotments. Most of the approximately 55 recipients who will get support will each get some 100,000 kroner. An additional 10 million kroner will be distributed subsequently. "We're talking of projects to be started in the future," Bjorn Bergmann-Paulsen of the SFT explains.

"Up to the present, nothing has been right on target where environmental solutions are concerned, but we hope that that is going to happen. It is important to realize that it will not be any ordinary pot where one can ask for money for projects, but we are open to good ideas and solutions," Bergmann-Paulsen says.

Minister of Environmental Affairs Kristin Hille Valla has great confidence in the "Cleaner Technology" program. "It is important to get the new work pattern tested. Money designated for that purpose is also needed as a stimulant in the years to come," she says.

Environmental Scrutiny

The Ministry of Environmental Affairs has also given its support to "environmental scrutiny" of certain factories

where consultants will go through all operations from A to Z, taking American manuals as their point of reference.

The first test factories were Greker Industrier and Noblikk-Tinpack in Ostfold. The next in turn will be Hunsfos Fabrikker and Peterson & Son.

Noblikk, in Moss, formerly discharged 85 tons of chemicals annually through its ventilation system. Now the factory is working on reducing that discharge by 90 percent in three years' time by switching over to a new way of thinking about paint: less use of chemicals and a switching over to more water-based paint.

In addition, the factory is saving at least three million kroner because it is avoiding the traditional solution by installing incinerators for chemicals.

"The potential is great for many branches of industry. That is particularly true of food, wood-processing, and galvanotechnical plants," says Department Head Ole Jorgen Hanssen of Ostfoldforskning in Fredrikstad.

The last carrot in the bunch that is to contribute to more environment-friendly industrial strategy is support for education and training in cooperation with the Norwegian Employers' Organization (NHO) and the Norwegian National Labor Organization (LO). Engineers, supervisors, and workers are to be offered courses on the environment, and the project will get started in 1991.

[Box, p. 16]

The Environment in Practice

On 27 July 1990, the government agreed to establish a national environment board that will see to it that the message from the Brundtland Committee is converted into practical Norwegian policy.

Prime Minister Jan P. Syse is to chair the committee, which will have a total of six members. In addition to Minister for Environmental Affairs Kristin Hille Valla, who will be the deputy chairman, representatives from

the NHO, the LO, the Central Association of Municipalities, and the Norwegian Association for the Preservation of Nature are to be members.

The committee will have the task of encouraging and promoting changes of attitude in society. It must further viable development nationally and internationally by stressing concern for the environment in all public and private sectors. It will hold decisionmakers responsible. The board will also work for improved cooperation on environment by the government, business, trade unions, research, volunteer organizations, and young people.

[Box, p. 16]

Analysis Required

To do a better job of preventing environmental problems, the government, on 27 July 1990, approved regulations requiring analysis of the consequences to the environment in large development projects in the country.

For the time being, it will be only the very biggest projects that will have to identify the environmental consequences. Large organizations in the nation's economic and public sectors will have to have an investment framework of at least 250 million kroner before such an analysis will be required. Furthermore, such an analysis will always be required before the construction of firing ranges, training fields, watercourses and other energy-producing installations, gas pipelines, and big transportation facilities such as highways and airports.

According to Minister for Environmental Affairs Kristin Hille Valla, this regulation will ensure that authorities, local communities, and others who are affected by big development projects will be informed of the potential effects at a sufficiently early stage to allow them to participate in the decisionmaking process. The developers themselves must pay for the analyses, and the regulations will take effect on 1 August 1990.